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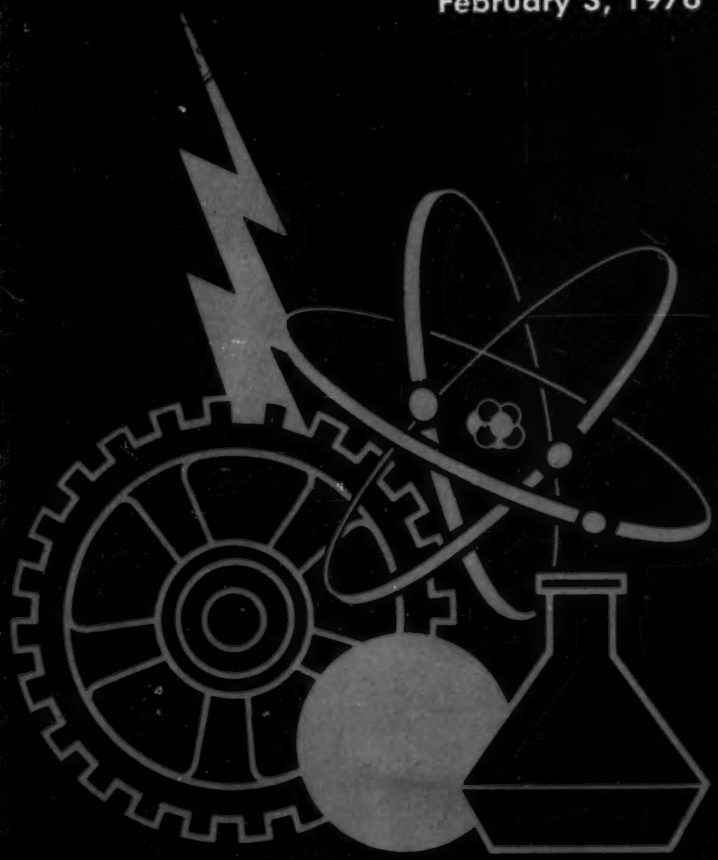

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 3, 1976 Volume 943 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of December 1975

Examiner affirmed	168
Examiner affirmed in part	44
Examiner reversed	68
Total	280

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,802,760, Derick and Frosch, OXIDATION OF SEMICONDUCTIVE SURFACES FOR CONTROLLED DIFFUSION, **filed** Sept. 17, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–1142, *Western Electric Company, Incorporated* v. *Mostek Corporation.*

3,043,045, L. P. Martuch, FLY FISHING LINE, **filed** July 10, 1975, D.C., N.D. Iowa (Sioux City), Doc. C–75–4039, *Minnesota Mining and Manufacturing Company* v. *Berkley & Company, Inc.*

3,216,459, Schroeder and Clark, FLEXIBLE INSULATED DUCT; **3,240,643,** same, METHOD AND APPARATUS FOR MAKING A FLEXIBLE INSULATED DUCT, **filed** June 20, 1967, D.C., C.D. Calif. (Los Angeles), Doc. 67–869–PH, *Clifford A. Schroeder, Quentin L. Clark, Glass Insulation and Pittsburgh Plate Glass Co.* v. *Owens-Corning Fiberglas Corp. et al.* Partial summary judgment, summary judgment and judgment of dismissal of second cause of action were all entered June 27, 1973, judgment from the United States Court of Appeals, Ninth Circuit, San Francisco, reversing the decision of said District Court, Apr. 15, 1975.

3,240,643. (See 3,216,459.)

3,841,348, C. O. Letendre, RELEASE SURFACES AND PROCESSES, **filed** Sept. 19, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3131, *Chromium Industries, Inc.* v. *Mirror Polishing & Plating Co., Inc.*

3,475,070, T. C. Hoshall, DISPLAY CASE, **filed** May 2, 1972, D.C., W.D. Okla. (Oklahoma City), Doc. 72–300–C, *Thomas C. Hoshall and Rainbo Photo Color, Inc.* v. *Dillard Department Stores, Inc. et al.* Upon stipulation of parties, action dismissed by Court without prejudice, Sept. 18, 1975.

3,489,498, Brody and Chaney, FLAME PHOTOMETRIC DETECTOR WITH IMPROVED SPECIFITY TO SULFUR AND PHOSPHORUS, **filed** Oct. 29, 1971, D.C., S.D. W. Va. (Charleston), Doc. 71–222–CH, *American Standard Inc. and Meloy Laboratories* v. *The Bendix Corporation.* The parties hereby stipulate to the dismissal of all claims and counterclaims of this action pursuant to Rule 41(a) and (c), FRCP, with prejudice, Aug. 18, 1975.

3,512,594, Grusin and Logan, BATHROOM SCALE, **filed** Apr. 29, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1365, *Gerald M. Grusin et al.* v. *Terraillon et al.* On motion of plaintiffs order cause is dismissed with prejudice and without costs, Sept. 29, 1975.

3,650,460, B. P. Lokey, PAPER BAG; **Re. 28,317,** T. W. Johnson, CULTIVATOR; **Re. 28,318,** W. W. Sloane, DRIVE MECHANISMS FOR SHAKER CONVEYORS, **filed** Aug. 20, 1975, D.C. Del. (Wilmington), Doc. 75–247, *St. Regis Paper Company* v. *Olinkraft, Inc.*

3,705,976, M. M. Platzman, REVENUE CONTROL SYSTEM FOR TOLL ROADS, **filed** Sept. 26, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75–851, *Michael M. Platzman* v. *Electron, Inc.*

3,717,963, W. A. Brady, Jr., PACKAGING COMPRESSIBLE MATERIAL, **filed** Sept. 29, 1975, D.C., N.D. Tex. (Dallas), Doc. CA–3–75–1195, *Roby Industries, Inc.* v. *Bass & Hayes Foundry, Inc. and Polyfoam, Inc.*

3,733,230, A. R. Prittie, LABEL INSPECTION SLITTER/REWINDER, **filed** Apr. 25, 1975, D.C., E.D. Mo. (St. Louis), Doc. 75–391C(4), *Arpeco Engineering Limited* v. *Allied Gear and Machine Company.* The complaint and counterclaim shall be and are hereby dismissed with prejudice, Sept. 19, 1975.

Re. 28,317. (See 3,650,460.)

Re. 28,318. (See 3,650,460.)

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

PART 4—FORMS FOR TRADEMARK CASES

Revised Rules and Procedures

On February 11, 1975, a notice of proposed rulemaking was published in the Federal Register (40 FR 6361) regarding the proposal by the Patent and Trademark Office to amend Title 37 of the Code of Federal Regulations by revising or amending §§ 1.12, 1.136, 1.197, 1.244, 1.256, 1.304, 2.18, 2.37, 2.75, 2.80, 2.85, 2.101, 2.102, 2.103, 2.105, 2.111, 2.112, 2,120, 2.123, 2.127, 2.129, 2.141, 2.144, 2.145, 2.162, 2.172, 2.183, 2.185, 2.187, and 4.2. Interested persons were given until May 1, 1975, to submit written comments and suggestions. Full and careful consideration was given to all written comments submitted and some changes in the original proposal have been made in view thereof.

Amendments are also now being made in sections which were not included in the published proposal, namely, §§ 2.11, 2.14, 2.15, 2.19, 2.93, 2.99, 2.113, 2.119, and 2.161; and section 4.3 is being deleted. Since these amendments are in accord with changes as to related matters in other sections which were contained in the published proposal, notice and public procedures thereon are deemed unnecessary.

The additional amendments, as well as changes from the text of the sections as published in the original proposal, are described below:

Paragraph (b) of § 1.197, paragraph (b) of § 1.256, paragraph (c) of § 2.129 and § 2.144 are being revised to include the name of the Board which may grant extension of time for requesting rehearing or reconsideration of a decision, that is, the Board of Appeals, the Board of Patent Interferences, or the Trademark Trial and Appeal Board.

Paragraph (a) of §1.304 (second sentence) and paragraph (d)(1) of § 2.145 (second sentence) are being revised to state more clearly that the time for filing a request for rehearing or reconsideration is determined under § 1.197(b) or § 1.256(b) in patent cases and § 2,129(c) or section 2.144 in trademark cases. These paragraphs are also being revised to make clear that if a request for rehearing or reconsideration, or modification of a decision, is acted on less than thirty days after the date of the decision, an appeal may still be filed or a civil action commenced within the original sixty-day period.

As to representation and powers of attorney, § 4.2 is being revised to state that individuals must be appointed in a power of attorney in order for the document to be regarded as a power, and §4.3, which is a form for the authorization of an agent, is being cancelled because normally persons who are recognized to practice before the Patent and Trademark Office in trademark cases are not designated as agents (see § 2.12). The form is outmoded and inaccurate, and in view of the relatively small amount of use which will probably be made of a form for authorizing representation by a person who is not an attorney, it is not believed necessary to provide a form for that purpose. In line with this change, the wording as to "agent" where it appears in either existing or proposed §§ 2.11, 2.14(c), 2.15, 2.18, 2.19, 2,93, 2,99(a) and (b), 2.102(a), 2.103, 2.113, 2.119(a) and (b) 2.123(e)(2), and 2.129(b), is being changed to "other authorized representative" or equivalent language, as appropriate.

In § 2.75 the word "effective" is being added to the second sentence in describing the original filing date.

In paragraph (e) of § 2.85, the clause which refers to the fee being less than the required amount because "a multiple class application or registration is" involved, is being reworded, for greater accuracy, to refer to the fee being less than the required amount because "multiple classes in an application or registration are" involved. At the end of the paragraph, the following is being added: ", or if action is sought only for the number of classes equal to the number of

fees submitted," the purpose of this addition being to make it clear that action may be taken as to less than all of the classes in a multiple class application or registration. In this connection, see also revised § 2,172. In paragraph (e) of § 2.85 the word "Examiner" is being changed to "Office" because the notification referred to is not necessarily handled by an examiner.

In § 2.101 wording is being added to make it clear that an opposition may be filed within an extension of time for filing opposition as well as within thirty days after publication of the mark. Also, the wording "Two or more persons may be joined" is being changed to "If persons are joined," since whether or not persons are properly joined is subject to review by the Trademark Trial and Appeal Board.

In paragraph (b) of § 2.102, the word "written" is being inserted before "request to extend the time" in the first sentence. Also, reference to a time for filing a showing of cause has been deleted as being superfluous. These modifications accord with Pub. L. 93–600, enacted January 2, 1975.

In § 2.103 the words "such filing" have been modified to read "the filing of such opposition" in order to assure the clarity of the meaning.

In addition, §§ 2.101, 2.102, and 2.103 taken as a unit are being reorganized to place topics in better sequence and to consolidate references to each topic in one place. This reorganization is for the purpose of clarity and does not make any change in substance.

The division of § 2.111 into paragraphs (a) and (b) has been eliminated, proposed paragraph (b) relating to insufficient fees being incorporated in the body of the section. The last sentence in proposed § 2.112 relating to insufficient fees has been deleted as being repetitious of § 2.111.

A sentence is being added at the end of section 2.112 indicating that a fee for each person for each class is required if persons are joined in a petition to cancel.

The pertinent wording in each of §§ 2.101, 2.102, 2.103, 2.111, 2.112, 2.141, 2.161, 2.162, and 2.183 is being changed to indicate more plainly that action may be taken on less than the total number of classes in an application or registration, and that in that event the particular class or classes for action should be specified. The pertinent wording in such sections has also been modified to state that action should "include" the appropriate number of fees rather than "be accompanied by" such fees, in order to accord with the present practice of accepting a fee if, it is received within the prescribed period even though it may not physically accompany the action.

Section 2.113 is being revised to change the word "notice" to "notification." In section 2.112 the word "notice" in the first sentence is likewise being changed to "notification." These changes accord with the equivalent change made in § 2.105 in the published proposal. The purpose is to make it clear that the paper which is prepared under these sections is merely a notification of the existence of a cancellation proceeding which commenced when a petition which is correct as to form was filed. The last word of paragraph (b) of § 2.113 is being changed from "registrant" to "respondent party" to agree with cancellation § 2.112.

Paragraph (c) in § 2.120 is being modified to provide that a written statement by the attorney for the moving party, rather than an affidavit or declaration, is sufficient in support of a motion for an order to compel discovery, and that if issues raised by the motion have been subsequently resolved, the attorney should merely advise the Trademark Trial and Appeal Board in writing of the matters which no longer require decision by the Board.

In § 2,162, the wording of paragraph (e) is being modified to indicate that the sixth year affidavit must state that the mark is in use except when there is excusable nonuse under paragraph (f) of such section. The wording of such paragraph also is being expanded to make clear the present practice that the specimen submitted with the sixth year affidavit be a specimen currently in use. In both paragraphs (e) and (f), in the second sentences, the second occurrence of the words "may be" is being deleted as unnecessarily repetitious.

In § 2.172, the proposed third sentence is being reworded to simplify the language, and at the end of the proposed fourth sentence the specific number (2.173) of the section referred to in the sentence is being added.

In § 2.183 the wording of paragraph (a) is being modified to indicate that the renewal application must state that the mark is still in use in commerce except when there is excusable nonuse under paragraph (c) of such section. In the last sentence of paragraph (c), the words "in order to show excusable nonuse" are being added after the word "explanation" for greater clarity, and in the same sentence the second occurrence of the words "may be" is being deleted as unnecessarily repetitious.

Section 2.187 is being reworded to make clear that not only is it permissible for a certificate of registration to issue to an assignee or in a new name of applicant, but that the certificate will be so issued whenever the Office knows of such situation in time to do so. Section 2.187 is being further reworded to clarify that for a certificate of registration to issue to an assignee or in a new name of applicant, the supporting document must be actually recorded by the time indicated; further, if the document is not actually recorded by such time, a statement placed in the application file by the time specified will accomplish the same result. Also added to § 2.187 is the statement that the address of the assignee may be provided by being placed in the recorded document.

In consideration of the comments received and pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93–596, 88 Stat. 1949), and in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 94–132, 85 Stat. 364) and amended on January 2, 1975 (Pub. L. 93–596, 88 Stat. 1949), Parts 1 and 2 of Chapter I of Title 37 of the Code of Federal Regulations are hereby revised or amended, as follows:

1. Section 1.12 is revised to read as follows:

§ 1.12. *Assignment records open to public inspection.*

The assignment records, relating to original or reissue patents, including digests and indexes, and assignment records relating to pending or abandoned trademark applications and to trademark registrations, are open to public inspection and copies of any instrument recorded may be obtained upon payment of the fee therefor. Assignment records, digests and indexes, relating to any pending or abandoned patent application are not available to the public. Copies of any such patent assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or his assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee or licensee of such patent application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules. An order for a copy of an assignment should give the identification of the record. If identified only by the name of the patentee and number of the patent, or in the case of a trademark registration by the name of the registrant and number of the registration, or by name of the applicant and serial number of the application, an extra charge will be made for the time consumed in making a search for such assignment.

2. In § 1.136, paragraph (b) is revised. As amended, § 1.136 reads as follows:

§ 1.136 *Time less than six months.*

* * * * *

(b) The time for reply, when a time less than six months has been set, will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. Only one extension may be granted by the primary examiner in his discretion; any further extension must be approved by the Commissioner. In no case can any extension carry the date on which response to an action is due beyond six months from the date of the action.

3. In § 1.197, paragraph (b) is revised. As amended, § 1.197 reads as follows:

§ 1.197 *Action following decision.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board

of Appeals so states. Such time may be extended by the Board of Appeals upon a showing of sufficient cause.

* * * * *

4. In § 1.244, paragraph (c) is revised. As amended, § 1.244 reads as follows:

§ 1.244 *Motions; miscellaneous provisions.*

* * * * *

(c) Any request for rehearing or reconsideration, or modification of the decision, must be filed within twenty days after the date of the decision, and any reply thereto shall be filed within twenty days from the date of service of the request.

* * * * *

5. In § 1.256, paragraph (b) is revised. As amended, § 1.256 reads as follows:

§ 1.256 *Final hearing.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Patent Interferences so states. Any reply thereto shall be filed within fifteen days from the date of service of the request. The times specified herein may be extended by the Board of Patent Interferences upon a showing of sufficient cause. (See § 1.304.)

6. Section 1.304 is revised to read as follows:

§ 1.304 *Time for appeal or civil action.*

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Customs and Patent Appeals (section 1.302) or for commencing a civil action (section 1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time specified in section 1.197(b) or 1.256 (b), or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

(b) The times specified herein are calendar days. If the last day of the time specified for appeal or commencing a civil action falls on a Saturday, Sunday or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Customs and Patent Appeals and an adverse party has filed notice under 35 U.S.C. 141 that he elects to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141.

7. Section 2.11 is revised to read as follows:

§ 2.11 *Applicants may be represented by an attorney.*

The owner of a trademark may file and prosecute his own application for registration of such trademark, or he may be represented by an attorney or other person authorized to practice in trademark cases. The Patent and Trademark Office cannot aid in the selection of an attorney or other representative.

8. In § 2.14, paragraph (c) is revised. As amended, § 2.14 reads as follows:

§ 2.14 *Advertising.*

* * * * *

(c) No person not an attorney, solicitor or lawyer shall, in any material specified in paragraph (b) of this section or in papers filed in the Patent and Trademark Office, represent himself to be an attorney, solicitor or lawyer.

9. Section 2.15 is revised to read as follows:

§ 2.15 *Signature and certificate of attorney or other representative.*

Every paper filed by an attorney at law or other person representing an applicant or party to a proceeding in the Patent or Trademark Office must bear the signature of such attorney at law or other person except those papers which are required to be signed by the applicant or party. The signature of an attorney at law or such other person to a paper filed by him, or the filing of any paper by him, constitutes a certificate that the paper has been read; that its filing is authorized; that to the best of his knowledge, information, and belief there is good ground to support it; and that it is not interposed for delay.

10. Section 2.18 is revised to read as follows:

§ 2.18 *Correspondence, with whom held.*

Correspondence will be sent to the applicant or a party to a proceeding at his address unless papers are transmitted by an attorney at law, or a written power of attorney is filed, or written authorization of other person entitled to be recognized is filed, or the applicant or party designates in writing another address to which correspondence is to be sent, in which event correspondence will be sent to the attorney at law transmiting the papers, or to the attorney at law designated in the power of attorney, or to the other person designated in the written authorization, or to the address designated by the applicant or party for correspondence. Correspondence will continue to be sent to such address until the applicant or party, or the attorney at law or other authorized representative of the applicant or party, indicates in writing that correspondence is to be sent to another address. Double correspondence will not be undertaken by the Patent and Trademark Office, and if more than one attorney at law or other authorized representative appears or signs a paper, the Office reply thereto will be sent to the address already established in the file until another correspondence address is specified by the applicant or party or by the attorney or other authorized representative of the applicant or party.

11. Section 2.19 is revised to read as follows:

§ 2.19 *Revocation of power of attorney or of other authorization to represent.*

Authority to represent an applicant or a party to a proceeding may be revoked at any stage in the proceedings of a case upon notification to the Commissioner; and when it is so revoked, the Office will communicate directly with the applicant or party to the proceeding or with such other qualified person as may be authorized. The Patent and Trademark Office will notify the person affected of the revocation of his authorization.

12. Section 2.37 is revised to read as follows:

§ 2.37 *Authorization for representation; U.S. representative.*

The authorization of a qualified person to represent applicant (section 2.17(b)) and the designation of a domestic representative (section 2.24) may be included as a paragraph or paragraphs in the application.

13. Section 2.75 is revised to read as follows:

§ 2.75 *Amendment to change application to different register.*

An application for registration on the Principal Register may be changed to an application for registration on the Supplemental Register and vice versa by amending the application to comply with the rules relating to the requirements for registration on the appropriate register, as the case may be. The original filing date may be considered the effective filing date for the purpose of proceedings in the Patent and Trademark Office provided the application as originally filed was sufficient for registration on the register to which amended. Otherwise, the filing date of the amendment will be considered the effective filing date of the application so amended.

14. Section 2.80 is revised to read as follows:

§ 2.80 *Publication for opposition.*

If, on examination or reexamination of an application for registration on the Principal Register, it appears that the applicant is entitled to have his mark registered, the mark will be published in the OFFICIAL GAZETTE for opposition. The mark will also be published in the case of an application to be placed in interference or concurrent use proceedings, if otherwise registrable.

15. In § 2.85, paragraph (e) is revised. As amended, § 2.85 reads as follows:

§ 2.85 *Classification schedules.*

* * * * *

(e) Where the amount of the fee received on filing an appeal in connection with an application or on filing an affidavit under section 8(a) or 8(b) or on an application for

renewal or in connection with an opposition or petition for cancellation is sufficient for at least one class of goods or services but is less than the required amount because multiple classes in an application or registration are involved, the appeal or the affidavit or renewal application or opposition or petition for cancellation will not be refused on the ground that the amount of the fee was insufficient if the required additional amount of the fee is received in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office, or if action is sought only for the number of classes equal to the number of fees submitted.

* * * * *

16. Section 2.93 is revised to read as follows:

§ 2.93 *Declaration of interference.*

An interference is declared and instituted by the mailing of a notice of interference to the parties. The notice shall be sent to each applicant, in care of his attorney or other representative of reord, if any, and if one of the parties is a registrant, the notice shall be sent to him or his assignee of record. The notice shall give the name and address of the adverse party and of his attorney or other authorized representative, if any, together with the serial number and date of filing and publication, if published, of each of the applications or registrations involved.

17. In § 2.99, paragraphs (a) and (b) are revised. As amended, §22.99 reads as follows:

§ 2.99 *Application to register as concurrent user.*

(a) An application for registration as a lawful concurrent user will be examined in the same manner as other applications for registration. When it is determined that the mark is ready for publication or allowance, except for questions relating to concurrent registration, the applicant may be required to furnish as many copies of his written application, specimens and drawing, as may be necessary. The Examiner of Trademarks shall prepare notices for the applicant and for each applicant, registrant, or user specified in the application for registration as a concurrent user. Such notices for the specified parties shall give the name and address of the applicant and of his attorney or other authorized representative. if any, together with the serial number and filing date of the application.

(b) The notices shall be sent to each of the parties, in care of their attorneys or other representatives, if they have attorneys or other representatives of record, and if one of the parties is a registrant, a notice shall also be sent to him or his assignee of record. A copy of the application shall be forwarded with the notices to the parties specified in the application. An answer to the notice is not required in the case of an applicant or registrant whose application or registration is specified in the application to register as concurrent user but a statement, if desired, may be filed within forty days after the mailing of the notice; in the case of other parties specified in th application to register as concurrent user, answer must be filed within forty days after the mailing of the notice.

* * * * *

18. Section 2.101 is revised to read as follows:

§ 2.101 *Filing an opposition.*

(a) Any person who believes that he would be damaged by the registration of a mark upon the Principal Register may oppose the same by filing an opposition in the Patent and Trademark Office within thirty days after publication of the mark sought to be registered (§ 2.80), or within an extension of the time for filing an opposition (§ 2.102). The opposition must be verified, or include a declaration in accordance with § 2.20, unless the opposition is filed by an attorney at law or other authorized representative in accordance with § 2.103.

(b) An opposition must include the required fee for each class sought to be opposed in the application. If fees insufficient to cover all classes in the application are submitted, the particular class or classes in which opposition is sought should be specified. If persons are jointed in an opposition, a fee for each class sought to be opposed in the application for each person so joined is required.

19. Section 2.102 is revised to read as follows:

§ 2.102 *Extension of time for filing opposition.*

(a) A request to extend the time for filing an opposition must be made by a person who believes that he would be damaged by the registration of the mark on the Principal Register, but an attorney at law or other person authorized to represent a party may file the request on behalf of a potential opposer. The potential opposer must be identified with reasonable certainty in the request. Any opposition filed during an extension of time should be in the name of the person to whom the extension was granted, but an opposition may be accepted if the person to whom the extension was granted was misidentified through mistake, or an opposition filed in a different name may be accepted if the person filing the opposition is in privity with the person to whom the extension was granted.

(b) A written request to extend the time for filing an opposition must be received in the Patent and Trademark Office before the expiration of thirty days from the date of publication, and should specify the period of extension desired. A first extension of time will be granted upon request if the extension is for not more than thirty days. Other extensions of time may be granted by the Commissioner for good cause.

20. Section 2.103 is revised to read as follows:

§ 2.103 *Opposition filed by attorney at law or other authorized representative.*

An opposition may be filed in the Patent and Trademark Office by an attorney at law or other person authorized to represent a party, either within thirty days after publication of the mark sought to be registered (§ 2.80), or within an extension of the time for filing an opposition (§ 2.102), but the opposition will be null and void unless confirmed by the opposer by verification, or by declaration in accordance with § 2.20, within thirty days after the filing of the opposition, or within such further time as may be fixed by the Commissioner upon request made before the expiration of the thirty days.

21. Section 2.105 is revised to read as follows:

§ 2.105 *Notification of opposition proceedings.*

A notification of an opposition which has been regularly filed shall be prepared, identifying the title and number of the proceeding and the application involved, and designating a time, not less than thirty days from the mailing date of such notification, within which answer must be filed. Copies of this notification shall be forwarded by the Trademark Trial and Appeal Board to the parties in care of their attorneys or other representatives, if they have attorneys or other representatives of record. The duplicate copy of the opposition and exhibits shall be forwarded with the notification to the applicant.

22. Section 2.111 is revised to read as follows:

§ 2.111 *Time for filing petition for cancellation.*

Any person who believes that he is or will be damaged by a registrant may, upon payment of the required fee for each class sought to be cancelled in the registration, apply to the Commissioner to cancel said registration as to the specified class or classes. A petition to cancel which includes insufficient fees to over all classes in the registration should specify the partiular class or classes for which cancellation is sought. Such petition may be made at any time in the case of registrations on the Supplemental Register or under the act of 1920, or registrations under the act of 1881 or the act of 1905 which have not been published under section 12(c) of the act (§ 2.153), and in cases involving the grounds specified in section 14(c), (d) and (e) of the act. In all other cases such petition must be made within five years from the date of registration of the mark under the act of 1946 or from the date of publication under section 12(c) of the act.

23. Section 2.112 is revised to read as follows:

§ 2.112 *Petition for cancellation.*

The petition to cancel, which must be verified, or include a declaration in accordance with § 2.20, must set forth a short and plain statement showing how the petitioner is or will be damaged by the registration, state the grounds for cancellation, and indicate the respondent party to whom notification shall be sent. A duplicate copy of the petition, including exhibits, shall be filed with the petition. Applications to cancel different registrations owned by the same party may be joined in one petition when appropriate, but the required fee must be included for each class sought to be cancelled in each registration against which each application to cancel is filed. If persons are joined in a petition to cancel, a fee

for each class sought to be cancelled for each person so joined is required.

24. In § 2.113, paragraph (b) and the title are revised. As amended, § 2.113 reads as follows:

§ 2.113 *Notification of filing of petition.*

* * * * *

(b) When the petition is correct as to form, a notification shall be prepared, identifying the title and number of the proceeding and the registration involved, and designating a time, not less than thirty days from the mailing date of such notification, within which answer must be filed. A copy of this notification shall be forwarded to the petitioner in care of his attorney or other representative, if he has an attorney or other representative of record. The duplicate copy of the petition and exhibits shall be forwarded with a copy of such notification to the respondent party.

25. In § 2.119, paragraphs (a) and (b) are revised. As amended, §2.119 reads as follows:

§ 2.119 *Service of papers.*

(a) Every paper filed in the Patent and Trademark Office in inter partes cases, including notice of appeal, must be served upon the other parties except the notice of interference (§ 2.93), the notification of opposition (§ 2.105), the petition for cancellation (§ 2.113), and the notice of a concurrent use proceeding (§ 2.99), which are mailed by the Patent and Trademark Office. Proof of such service must be made before the paper will be considered by the Office. A statement signed by the attorney or other authorized representative, attached to or appearing on he original paper when filed, clearly stating the date and manner in which service was made will be accepted as prima facie proof of service.

(b) Service of papers must be on the attorney or other authorized representative of the party if there be such or on the party if there is no attorney or other authorized representative, and may be made in either of the following ways: (1) By delivering a copy of the paper to the person served; (2) by leaving a copy at the usual place of business of the person served, with someone in his employment; (3) when the person served has no usual place of business, by leaving a copy at his residence, with a member of his family over 14 years of age and of discretion; (4) transmission by first-class mail, which may also be certified or registered. Whenever it shall be satisfactorily shown to the Commissioner that none of the above modes of obtaining service or serving the paper is practicable, service may be by notice published in the OFFICIAL GAZETTE.

* * * * *

26. In § 2.120, paragraph (c) is revised. As amended, § 2.120 reads as follows:

§ 2.120 *Discovery procedure.*

* * * * *

(c) Failure to make discovery: Sanctions.

(1) If any party fails or refuses to answer any proper question in taking discovery depositions or fails or refuses to answer any proper question propounded by interrogatories or fails or refuses to comply with a request to produce and permit the inspection and copying of designated things, the party seeking discovery may file a motion with the Trademark Trial and Appeal Board for an order compelling discovery. Such a motion must be supported by a written statement by the attorney for the moving party that the moving party or its attorney has conferred with the opposing party or its attorney in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by the motion are subsequently resolved between the parties, the attorney for the moving party should advise the Trademark Trial and Appeal Board in writing of the matters in the motion which no longer require decision by the Board.

(2) If a party or an officer, director, or managing agent of a party, or a person designated under Rule 30(b)(6) or 31(a) of the Federal Rules of Civil Procedure to testify on behalf of a party, fails to obey an order to provide or permit discovery, the Trademark Trial and Appeal Board may strike out all or any part of any pleading of that party, dismiss the action or proceeding, or deny any part thereof, enter judgment as by default against that party or take any such other action as may be deemed appropriate.

27. In § 2.123, paragraph (e)(2) is revised, and paragraph (g)(3) is added. As amended, § 2.123 reads as follows:

§ 2.123 *Trial testimony in inter partes cases.*

* * * * *

(e) * * *

(2) The deposition shall be taken in answer to questions, with the questions and answers recorded in their regular order by the officer, or by some other person (who shall be subject to the provisions of Rule 28 of the Federal Rules of Civil Procedure) in the presence of the officer except when his presence is waived on the record by agreement of the parties. The testimony shall be taken stenographically and transcribed, unless the parties present agree otherwise. In the absence of all opposing parties and their attorneys or other authorized representatives, depositions may be taken in longhand, typewriting, or stenographically.

* * * * *

(g) * * *

(3) Each deposition must contain an index of the names of the witnesses, giving the pages where their examination and cross-examination begin, and an index of the exhibits, briefly describing their nature and giving the pages at which they are introduced and offered in evidence.

* * * * *

28. In § 2.127, paragraph (b) is revised. At amended, § 2.127 reads as follows:

§ 2.127 *Motions.*

* * * * *

(b) Any request for rehearing or reconsideration, or modification of a decision, on a motion which is not finally dispositive of the case, must be filed within thirty days from the date thereof. Any brief in opposition shall be filed within fifteen days after service of the request.

* * * * *

29. In § 2.129, paragraphs (b) and (c), and the title, are revised. As amended, § 2.129 reads as follows:

§ 2.129 *Oral argument, and reconsideration.*

* * * * *

(b) Hearings may be advanced or adjourned, as far as is convenient and proper to meet the wishes of the parties and their attorneys or other authorized representatives.

(c) Any request for rehearing or reconsideration, or modification of a decision, including a decision on a motion which is finally dispositive of a case, must be filed within thirty days from the date thereof. Any brief in opposition shall be filed within fifteen days after service of the request. The times specified herein may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

30. Section 2.141 is revised to read as follows:

§ 2.141 *Ex parte appeals from the Examiner of Trademarks.*

Every applicant for the registration of a mark may, upon final refusal by the Examiner of Trademarks, appeal to the Trademark Trial and Appeal Board upon payment of the prescribed fee for each class in the application for which an appeal is taken. An appeal which includes insufficient fees to cover all classes in the application should specify the particular class or classes in which an appeal is taken. A second refusal on the same grounds may be considered as final by the applicant for purpose of appeal.

31. Section 2.144 is revised to read as follows:

§ 2.144 *Reconsideration of decision on ex parte appeal.*

Any request for rehearing or reconsideration, or modification of the decision, must be filed within thirty days from the date of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

32. In § 2.145, paragraphs (a), (b), and (d) are revised. As amended, § 2.145 reads as follows:

§ 2.145 *Appeal to court and civil action.*

(a) Appeal to U.S. Court of Customs and Patent Appeals. An applicant for registration, or any party to an interference, opposition, or cancellation proceeding who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under Section 8 of the act or who has filed an application for renewal and is dissatisfied with the decision of the

Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Customs and Patent Appeals. The appellant must take the following steps in such an appeal: (1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section); (2) in the court, file a petition of appeal and a certified transcript of the record within a specified time after filing the appeal, and pay the fee for appeal, as provided by the rules of the court. The transcript will be transmitted to the Court by the Patent and Trademark Office on order of and at the expense of the appellant. Such order should be filed with the notice of appeal, but in no case should it be filed later than fifteen days thereafter.

(b) Notice of appeal.

(1) When an appeal is taken to the U.S. Court of Customs and Patent Appeals, the appellant shall give notice thereof in writing to the Commissioner, which notice shall be filed in the Patent and Trademark Office, within the time specified in paragraph (d) of this section. The notice shall specify the party or parties taking the appeal and shall designate the decision or part thereof appealed from.

(2) In inter partes proceedings, the notice must be served as provided in § 2.119.

* * * * *

(d) Time for appeal or civil action.

(1) The time for filing the notice of appeal to the U.S. Court of Customs and Patent Appeals (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is sixty days from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time specified in section 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

(2) The times specified herein are calendar days. If the last day of time specified for appeal, or commencing a civil action falls on a Saturday, Sunday or legal holiday, the time is extended to the next day which is neither a Saturday, Sunday nor a holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Customs and Patent Appeals and an adverse party has filed notice under section 21(a)(1) of the act that he elects to have all further proceedings conducted under section 21(b) of the act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the act.

33. Section 2.161 is revised to read as follows:

§ 2.161 *Cancellation for failure to file affidavit or declaration during sixth year.*

Any registration under the provisions of the act of 1946 and any registration published under the provisions of section 12(c) of the act (§ 2.153) shall be cancelled as to any class in the registration at the end of six years following the date of registration or the date of such publication, unless within one year next preceding the expiration of such six years the registrant shall file in the Patent and Trademark Office an affidavit or declaration in accordance with § 2.20 showing that said mark is still in use as to such class or showing that its non-use as to such class is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

34. Section 2.162 is revised to read as follows:

§ 2.162 *Requirements for affidavit or declaration during sixth year.*

The affidavit or declaration required by § 2.161 must:

(a) Be executed by the registrant after expiration of the five-year period following the date of registration or of publication under section 12(c) of the act;

(b) Be filed in the Patent and Trademark Office before the expiration of the sixth year following the date of registration or of publication under section 12(c) of the act;

(c) Identify the certificate of registration by the registration number and date of registration;

(d) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified;

(e) State that the registered mark is in use (except under paragraph (f) of this section). The statement must be supported by evidence which shows that the mark is still in use, and normally such evidence consists of a specimen or a facsimile specimen which is currently in use, or a statement of facts concerning use. The supporting evidence should be submitted with the affidavit or declaration, but if it is not or if the evidence submitted is found to be deficient, the evidence, or further evidence, may be submitted and considered even though filed after the sixth year has expired;

(f) If the registered mark is not still in use, recite facts to show that nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. If the facts recited are found not to be sufficient, further evidence or explanation may be submitted and considered even though filed after the sixth year has expired; and

(g) Contain the statement of use or statement as to nonuse and appropriate evidence in support thereof, as required in paragraphs (e) and (f) of this section, for each class to which the affidavit or declaration pertains in the registration.

35. Section 2.172 is revised to read as follows:

§ 2.172 *Surrender for cancellation.*

Upon application by the registrant, the Commissioner may permit any registration to be surrendered for cancellation. Application for such action must be signed by the registrant and must be accompanied by the original certificate of registration, if not lost or destroyed. When there is more than one class in a registration, one or more entire class but less than the total number of classes may be surrendered as to the specified class or classes. Deletion of less than all of the goods or services in a single class constitutes amendment of registration as to that class (see § 2.173).

36. In § 2.183, paragraphs (a), (b), and (c) are revised. As amended, § 2.183 reads as follows:

§ 2.183 *Requirements for application for renewal.*

(a) The application for renewal must include a statement which is verified or which includes a declaration in accordance with § 2.20 by the registrant setting forth the goods or services recited in each class for which renewal is sought in the registration on or in connection with which the mark is still in use in commerce, specifying the nature of such commerce (except under paragraph (c) of this section). This statement must be executed not more than six months before the expiration of the registration and must:

(1) Be accompanied by a specimen or facsimile specimen for each class for whih renewal is sought in the registration showing current use of the mark.

(2) Include the required fee for each class for which renewal is sought in the registration, and an additional fee for each class in the case of a delayed application for renewal. If the application for renewal includes insufficient fees to over all classes in the registration, the particular class or classes for which renewal is sought should be specified.

(b) The declaration or verified statement, specimen or facsimile specimen and the fee for each class for which renewal is sought in the registration must be filed within the period prescribed for applying for renewal. If defective or insufficient, they cannot be completed after the period for applying for renewal has passed; if completed after the initial six month period has expired but before the expiration of the three month delay period, the application can be considered only as a delayed application for renewal.

(c) If the mark is not in use in commerce at the time of filing of the declaration or verified statement as to any class for which renewal is sought, facts must be recited to show that nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. There must be a recitation of facts as to nonuse for each class for which renewal is sought or it must be clear that the facts recited apply to each class sought to be renewed. If the facts recited require amplification or explanation in order to show excusable nonuse, further evidence may be submitted and considered even though filed after the period for applying for renewal has passed.

* * * * *

37. In § 2.185, paragraphs (a)(2) and (a)(4) are revised. As amended, § 2.185 reads as follows:

§ 2.185 *Requirements for assignments.*

(a) Assignments under section 10 of the act of registered marks, or marks for which an application for registration has been filed, will be recorded in the Patent and Trademark Office. Other instruments which may relate to such marks may be recorded in the discretion of the Commissioner. No assignment will be recorded, except as may be ordered by the Commissioner, unless it has been executed and unless:

* * * * *

(2) It is in the English Language or, if not in the English language, accompanied by a translation signed by the translator;

* * * * *

(4) A designation of a domestic representative is made in case the assignee is not domiciled in the United States. The designation must be separate from the assignment and there must be a separate designation for each registration or application assigned in one instrument.

38. Section 2,187 is revised to read as follows:

§ 2.187 *Certificate of registration may issue to assignee.*

The certificate of registration may be issued to the assignee of the applicant, or in a new name of applicant, and certificate of registration will be so issued provided an appropriate document is of record in the Assignment Division of the Patent and Trademark Office no later than the time the notice of publication is mailed, or if such document is not of record, then if a statement that such document has been filed for recordation is in the application file by the time the application is being prepared for issuance of the certificate of registration. The address of the assignee must be made of record in the application file or in the recorded document.

39. Section 4.2 is revised to read as follows:

§ 4.2 *Power of attorney accompanying application.*

Applicant hereby appoints ---------- (8)

---------- to prosecute this application
(address)

to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.

NOTE: (8) An individual must be appointed. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

§ 4.3 [*Removed*]

40. Section 4.3 is removed.

Effective date: These amendments become effective on February 1, 1976.

Dated: December 11, 1975.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: December 24, 1975.

DAVID B. CHANG,
Deputy Assistant Secretary for Science and Technology.

[FR Doc. 75-35246; Filed 12-31-75; 9:53 am]

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest

involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examining group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Director will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

PATENT NOTICES

Certificates of Correction for the Week of Feb. 3, 1976

Re. 28,593	3,877,940	3,903,142	3,910,984
D. 233,496	3,878,304	3,903,143	3,911,129
D. 234,515	3,878,379	3,903,262	3,911,138
3,489,752	3,879,499	3,903,347	3,911,209
3,577,512	3,879,890	3,904,299	3,911,256
3,637,701	3,880,613	3,904,356	3,911,526
3,752,771	3,880,657	3,904,420	3,911,732
3,759,837	3,881,015	3,904,795	3,911,785
3,788,390	3,882,129	3,904,833	3,911,802
3,794,733	3,884,177	3,905,029	3,912,412
3,797,965	3,884,658	3,905,131	3,912,426
3,798,216	3,884,941	3,905,225	3,912,789
3,801,934	3,886,466	3,905,361	3,913,220
3,802,589	3,887,312	3,905,384	3,913,344
3,805,401	3,887,603	3,905,465	3,913,546
3,806,843	3,888,029	3,905,636	3,913,785
3,807,479	3,888,255	3,905,792	3,913,985
3,810,847	3,889,197	3,905,886	3,914,116
3,812,945	3,889,656	3,906,070	3,914,158
3,819,972	3,890,558	3,906,229	3,914,242
3,820,553	3,890,571	3,906,331	3,914,629
3,824,208	3,890,720	3,907,274	3,915,174
3,827,760	3,890,947	3,907,398	3,915,553
3,831,466	3,892,319	3,907,414	3,915,659
3,831,697	3,892,654	3,907,690	3,915,731
3,833,175	3,892,687	3,907,807	3,915,794
3,836,382	3,894,202	3,907,916	3,916,138
3,841,824	3,894,308	3,908,912	3,916,156
3,846,883	3,894,627	3,908,969	3,916,172
3,847,711	3,894,790	3,909,005	3,916,203
3,854,074	3,895,152	3,909,318	3,916,226
3,856,534	3,895,453	3,909,477	3,916,297
3,859,947	3,898,445	3,909,498	3,916,330
3,860,555	3,899,207	3,909,581	3,916,412
3,863,886	3,899,518	3,909,647	3,916,528
3,865,039	3,900,465	3,909,709	3,916,669
3,870,026	3,901,904	3,909,785	3,916,835
3,872,055	3,901,905	3,909,871	3,917,097
3,872,468	3,901,922	3,910,128	3,917,877
3,873,615	3,902,037	3,910,335	3,917,896
3,875,608	3,902,412	3,910,511	3,920,453
3,875,728	3,902,672	3,910,895	3,930,888
3,877,139	3,903,115	3,910,900	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 3, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-19-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-3-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination: Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-13-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-1-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-7-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-10-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-23-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-15-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-19-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-4-75

Expiration of patents: The patents within the range of numbers indicated below expire during January 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 704), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,866,973 to 2,871,478 inclusive
Plant Patents..... Numbers 1,792 to 1,804 inclusive

PATENT APPLICATIONS

PUBLISHED FEBRUARY 3, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before May 3, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 373,344

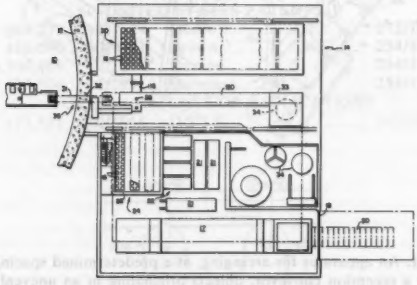
FUEL TRANSFER SYSTEM FOR A NUCLEAR REACTOR

Leonard R. Katz; James R. Marshall, both of Pittsburgh, and Walter E. Desmarchais, Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 25, 1973, Ser. No. 373,344
Int. Cl.[2] F23K *3/00*
U.S. Cl. 214—18 N **5 Claims**

References Cited
UNITED STATES PATENTS

2,575,650	11/1951	Alexander	200/52
3,020,225	2/1962	Wootton	176/30
3,194,742	7/1965	Aubert et al.	176/30
3,260,384	7/1966	Lemesle et al.	214/18 N
3,637,096	2/1969	Crates	214/18 N
3,756,914	9/1973	Whittaker	214/18 N
3,765,549	10/1973	Jones	176/30



1. A system for transferring fuel assemblies between a fuel handling building and a nuclear reactor wherein the fuel handling building includes new and spent fuel pits and an operating deck on the top surface of walls forming said pits, a reactor containment area separated from said building by a containment wall, and a canal adapted to be filled with water extending from said pits to the reactor containment area to permit submerged movement of the fuel assemblies between the building and the nuclear reactor comprising:

said canal being arranged to extend through said wall and a valve mounted therein for selectively establishing communication between said building and containment area;

a base supporting rails which extend from the building through the canal into the containment area;

a car on said rails and means connected with the car for providing car linear movement between the fuel handling building and containment area;

a fuel assembly handling container rotatably mounted at its midpoint on said car;

first and second power actuating means respectively mounted on the base in the fuel handling building and the containment area, each of said actuating means including a reciprocable arm associated with the container for rotating it between vertical and horizontal positions;

thereby permitting loading and unloading of a fuel assembly therein and facilitating movement of the car through the canal;

car position indicating means for determining the position of said car in the fuel building and in said containment area, said position indicating means including car position indicators on said operating deck connected with switches mounted on said base and at locations where said car is to be stopped at its extreme ends of travel; and

an actuator on said car which cooperates with said switches connected to said car position indicators to thereby show on the operating deck the position of said car; said car position indicating means further includes actuators on said container and switches on said base adapted by said actuators to show the vertical and horizontal orientation of said container.

B 381,985

THIN-FILM OPTICAL WAVEGUIDE

Ivan Paul Kaminow, New Shrewsbury, and Herwig Werner Kogelnik, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 23, 1973, Ser. No. 381,985
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96 WG **2 Claims**

References Cited
UNITED STATES PATENTS

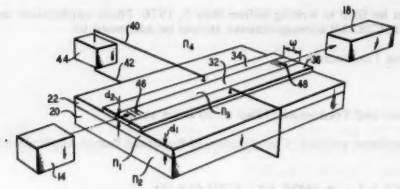
3,537,020	10/1970	Anderson	350/96 WG X
3,795,433	3/1974	Channin	350/96 WG
3,795,434	3/1974	Ash	350/96 WG

OTHER PUBLICATIONS

Noda et al., "A Novel Optical Waveguide for Integrated Optics" *Digest of Technical Papers, 1973 IEEE/OSA Conference on Laser Engineering Applications*, May 30–June 1, 1973, p. 67.

1. In combination, a planar dielectric thin-film waveguiding layer, passive means in contact with one surface of said layer for defining a said layer a region having an effective index of refraction that is higher than that in the other regions of said layer whereby waveguiding in said planar layer is confined to said defined region, wherein said passive means comprises a single longitudinal dielectric stripe element deposited on a portion of the top surface of said layer directly overlying said defined region, means for coupling an optical beam to one end of said defined region, means for extracting an optical beam

from the other end of said defined region, wherein said layer comprises an electro-optic material, and further including spaced-apart longitudinally extending electrodes deposited on the top surface of said layer on the respective sides of said single dielectric stripe element, and still further comprising an



ambient medium in contact with any remaining portions of the top surface of said layer and in contact with the top surfaces of said stripe element and of said electrodes, the index of refraction of said single stripe element being greater than the index of refraction of said medium but less than the index of refraction of said layer.

B 398,220

COOLED IGNITER

Thomas L. DuBell, Maineville, and Thomas C. Campbell, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

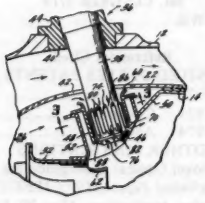
Filed Sept. 17, 1973, Ser. No. 398,220
Int. Cl.² F02C 7/18, 7/26
U.S. Cl. 431—264 **7 Claims**

References Cited
UNITED STATES PATENTS

2,693,082	11/1954	Arthur	60/39.67
2,831,993	4/1958	Lentz	60/39.82 S
2,840,742	6/1958	Watters	60/39.67
2,865,441	12/1958	Coupe	60/39.82 S
3,057,159	10/1962	Benedict	60/39.82 S
3,330,985	7/1967	Johnston	60/39.82 S
3,736,748	6/1973	Walker et al.	60/39.67

FOREIGN PATENTS OR APPLICATIONS

1,239,216	10/1959	France	317/98
875,342	8/1961	United Kingdom	60/39.82 R



1. In a fuel igniter for use in a combustion chamber, the igniter comprising a cylindrical housing projecting generally radially into the combustion chamber, the housing terminating in a heated tip extending through a generally annular ferrule, the improvement comprising:

a plurality of first channels spaced circumferentially about the outer surface of said housing and aligned generally axially thereof;

a circumferential second channel formed within the outer surface of said housing proximate said heated tip and intersecting preselected of said first channels;

first means for providing a flow of cooling air to said first channels;

second means for collecting said cooling air within said second channel; and

third means for exhausting said cooling air from said second channel generally normally of said housing and substantially only in a direction downstream thereof into said combustion chamber.

B 424,989

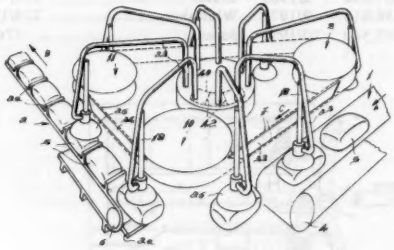
APPARATUS FOR ARRANGING, AT A PREDETERMINED SPACING ON A RECEPTION CONVEYOR, OBJECTS ORIGINATING IN A DISORDERED MANNER FROM A DELIVERY CONVEYOR

Franco Aiuola, Bologna, Italy, assignor to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

Filed Dec. 14, 1973, Ser. No. 424,989
Claims priority, application Italy, Dec. 18, 1972, 3619/72
Int. Cl.² B65G 15/00
U.S. Cl. 198—179 **8 Claims**

References Cited
UNITED STATES PATENTS

3,300,063	1/1967	Jensen et al.	198/179
3,302,803	2/1967	Mooney	214/1 BA



1. An apparatus for arranging, at a predetermined spacing on a reception conveyor, objects originating in an unevenly spaced manner from a delivery conveyor, in which the delivery conveyor is driven with continuous motion whereas the reception conveyor is driven with intermittent motion, and comprising a flexible closed loop member lying in a horizontal plane, of which a first portion extends parallel to the end part of the delivery conveyor and a second portion extends parallel to the initial part of the reception conveyor, a series of suckers distributed along said flexible member and mobile vertically by means of cams disposed along said first and second portions for causing the suckers to move close to the delivery and reception conveyors and a distributor member arranged to connect and disconnect the suckers cyclically to and from suction means for taking the objects from the delivery conveyor and depositing them respectively on the reception conveyor, the speed of said flexible member being constant and different from that of the delivery conveyor, and the reception conveyor during the intermittent advancement stroke being arranged to attain a speed equal and concordant with that of the flexible member.

B 434,206

SKID RESISTANCE OF ASPHALT SURFACE ROADS

Richard J. Bennett; Ollie G. Buck, and John L. Buster, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 17, 1974, Ser. No. 434,206
Int. Cl.² E01C 7/06
U.S. Cl. 404—77 8 Claims

References Cited
UNITED STATES PATENTS

121,082	11/1871	Burlew	106/284
237,662	2/1881	DeSmedt	208/4
1,512,125	10/1924	Mende	404/79
1,661,828	3/1928	Hopkinson	264/31
2,182,837	12/1939	Bacon	404/79
2,254,463	9/1941	Wells	404/95
2,686,166	8/1954	Taylor	404/72 X

1. A method for improving a pavement having an oxidizable surface which is slippery comprising subjecting each portion of the surface of the pavement to flame treatment for one second to 5 minutes with the distance of the flame from the pavement being between impingement and about 24 inches, so that said surface is oxidized sufficiently to improve the skid resistance, said treatment being such that no substantial layer of the surface is melted.

B 437,559

METHOD AND DEVICE OF REBLOCKING TO AN INCREASED OR REDUCED NUMBER OF ROPE PARTS AT A HOISTING GEAR

Rickard Andersson, Vasteras, Sweden, assignor to Linden-Alimak AB, Vasteras, Sweden

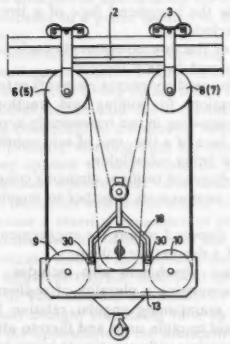
Filed Jan. 29, 1974, Ser. No. 437,559
Claims priority, application Sweden, Feb. 9, 1973, 7318228
Int. Cl.² B66D 3/04
U.S. Cl. 254—188 7 Claims

References Cited
UNITED STATES PATENTS

308,275	11/1884	Oborn	212/102
466,090	12/1891	Brown	254/188
3,306,469	2/1967	Durand	254/188
3,620,504	11/1971	Morrison	254/188

FOREIGN PATENTS OR APPLICATIONS

171,531	10/1965	U.S.S.R.	212/102



1. A method of reblocking a hoisting gear to a different number of cable parts, said hoisting gear including a lifting cable, an upper block means and a lower block means hanging under the upper block means in at least two rope parts of the lifting cable, the upper block means having at least two spaced apart pulleys, between which one part of the lifting cable runs on the same level as the upper block means, characterized in that the lower block means is lifted up to the upper block means and a portion of the cable running between said two spaced apart pulleys is engaged by a cable engaging means attached to the lower block means and also characterized in that the lifting cable pulled down between said two pulleys on said upper block means is moved manually from said engaging means and placed around a special pulley of the lower block means in reblocking to more cable parts and that the reverse procedure is used in reblocking to fewer cable parts.

B 443,163

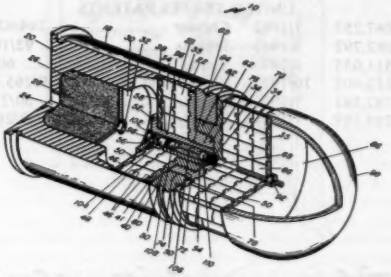
INFRASTAR CANNISTER CARTRIDGE

Edgar M. Shurtleff, Downey, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 15, 1974, Ser. No. 443,163
Int. Cl.² F42B 7/04, 13/18, 13/48
U.S. Cl. 102—42 R 3 Claims

References Cited
UNITED STATES PATENTS

1,203,649	11/1916	Papuga	102/42 C
1,292,374	1/1919	Richardson	102/67
2,343,818	3/1944	Sweeley	102/42 R
2,767,656	10/1956	Zeamer	102/42 R
3,074,344	1/1963	Devaux	102/42 C
3,320,882	5/1967	Schulz	149/35
3,724,378	4/1973	Knight et al.	102/42 C



1. An internally fragmenting shape released cartridge which comprises:

a cup shaped cartridge case having a partialy closed end and an open end;

a primer fixedly axially positioned in said closed end;

propellant means operatively positioned within said cartridge case adjacent said primer for generating gas pressure within said cartridge case upon initiation by said primer;

first fragment means operatively disposed in the open end of said cartridge case and means for holding said first fragment means together during a first interval of time and for releasing said first fragment means after said first interval of time which includes;

a disc shaped first retainer plate member having a plurality of operatively disposed protrusion line-up bores and an axial clearance hole therein;

a plurality of interlocking cylindrically shaped fragments operatively arranged in a two-tier annular fragment assembly, said two-tier assembly having protrusions on a first end which slidably engage said line-up bores in said first retainer plate member; and

a disc shaped second retainer plate member having a plurality of operatively disposed protrusion line-up bores therein, and a central threaded hole therein, said annular fragments assembly also having protrusions on its second

end which slidably engage said line-up bores in said second retainer plate member;

second fragment means attached to said first fragment means and means for holding said second fragment means together during said first interval of time and for releasing said second fragment means after a second interval of time; and

means for releasing said first fragment means comprising delay means axially positioned within said first fragment means operatively disposed adjacent said means for releasing said second fragment means for sequentially initiating the release of said first and second fragment means so that a double cone pattern of shot is generated by firing of said cartridge;

wherein said delay means passes through said axial clearance hole and said fragment assembly to threadedly engage the central threaded hole of said second retainer plate member.

B 445,459

COWLING ARRANGEMENT FOR A TURBOFAN ENGINE

Anthony Joseph Chamay, Marblehead; James Smith, Topsfield, and Thomas Neil Hull, Jr., Marblehead, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Feb. 25, 1974, Ser. No. 445,459

Int. Cl.² F02K *3/02*; B64C *15/06*

U.S. Cl. 60—226 A **9 Claims**

References Cited

UNITED STATES PATENTS

3,047,257	7/1962	Chester	244/42 DA
3,082,792	3/1963	Jenkins	92/101 X
3,511,055	5/1970	Timms	60/229
3,612,402	10/1971	Timms et al.	239/265.41 X
3,747,341	7/1973	Davis	60/226 A
3,785,567	1/1974	Fischer	239/265.39

1. A fan cowling for a gas turbofan engine said cowling being spaced apart from a core engine to define an annular bypass duct therebetween and comprising:

a forward fixed portion;

an aft variable portion including a unison ring in axial alignment with the fixed portion;

a plurality of circumferentially spaced apart nozzle flaps disposed to be freely rotatable between limit stops around the aft end of the unison ring such that the differential air pressure existing between the bypass duct airflow and the ambient causes the nozzle flaps to rotate radially outward to a maximum nozzle area position;

an inflatable bladder in engagement with the unison ring; and

actuating ring means translatably disposed relative to the unison ring between the bladder and nozzle flaps for translating downstream to engage and rotate the nozzle flaps radially inward upon inflation of the bladder to thereby decrease the exhaust area of the bypass duct and prevent the nozzle flaps from being rotated further radially outward by said differential air pressure.

B 445,690

TRACTION MEANS FOR RESILIENT TIRES OF MOTOR VEHICLES

Alexander Lossev, 1480 Rte. 46, Apt. 294-A, Parsippany, N.J. 07054

Filed Feb. 25, 1974, Ser. No. 445,690

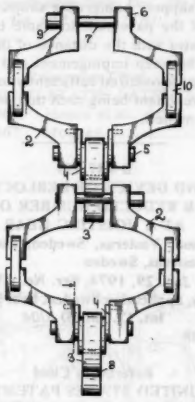
Int. Cl.² B60C *27/08*

U.S. Cl. 152—213 R **3 Claims**

References Cited

UNITED STATES PATENTS

1,399,179	12/1921	Angelo	152/171
2,580,272	12/1951	Bell	152/221
2,754,873	7/1956	Willis	152/229
3,042,095	7/1962	Knowles	152/213
3,079,971	3/1963	Iaquinta	152/179
3,251,392	5/1966	Connell	152/228
3,675,701	7/1972	Garrison	152/225



1. A traction attachment for resilient tires comprising a plurality of interlinked traction units each provided with a coupler arm pivotally linking it in releasable relation with the next adjacent unit thus to form catenation of a length sufficient to encircle the peripheral face of a tire; each of said traction units includes:

a. a number of traction components each having perforations in one end portion thereof,

b. centrally disposed connector elements extending through said perforations for joining said traction components into pairs extending in use transversely across the ground contacting face of a tire, one of said connector elements in each unit being retractable,

c. bilaterally disposed resilient elements coupling said pairs of traction components together in angular correlation, and

d. bilaterally disposed means for engagement with the side portions of a tire between them,

Said traction attachment also includes: self-applicable means comprising a plurality of resilient means interposingly maintaining angular relation between every one of said traction units and thereto attached coupler arm and reciprocally reacting to pressure being exerted by longitudinally rolling the tire over said attachment tire, and interlocking means disposed at one end of said attachment and a retractable element at the other end thereof providing in combination means for securing said attachment on the tire by connecting the opposite ends thereof together by rolling a tire thereover.

B 464,290

LIQUID LEVEL MEASURING AND INDICATING APPARATUS

Charles Guidicelli, 330 Rue de Noisy, Blaynolet 93, France

Filed Apr. 25, 1974, Ser. No. 464,290

Claims priority, application France, May 22, 1973, 73.18497

Int. Cl.² G01F 23/16

U.S. Cl. 73—302 3 Claims

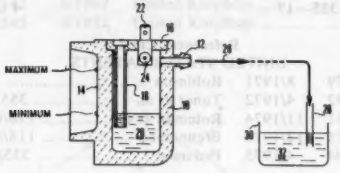
References Cited

UNITED STATES PATENTS

2,012,511	8/1935	Hubbard	73/302 X
3,230,769	1/1966	Carver et al.	73/302 X
3,307,397	3/1967	Brown et al.	73/302
3,834,236	9/1974	Durin	73/302

FOREIGN PATENTS OR APPLICATIONS

1,122,273	1/1962	Germany	73/299



1. In a vehicle, a fluid level indicator for checking the corresponding quantity of lubricant in the crankcase of the vehicle, said fluid level indicator comprising:

a housing having a reservoir therein for retaining a quantity of fluid, said housing being constructed of a transparent material so that the level of said fluid in the reservior is visible to an operator through a wall therein;

a liquid column gas-pressure gauge having a straight measuring tube with one end exposed to atmosphere and the other end immersed in said fluid in the reservoir;

cover means attached to said housing to establish an air filled enclosure above said fluid, said cover means having an opening therein through which air from the atmosphere can freely be communicated;

conduit means attached to said housing for connecting said air filled enclosure to a probe located in the lubricant in the crankcase;

valve means associated with said opening in the cover means for sealing said reservoir from the atmosphere; and

an electrical resistance heating means located in said reservoir and connected to said valve means, said heating means being connected to s source of voltage in parallel with an oil pressure warning light for the vehicle, said voltage being applied to said resistance heating means which will initially operate said valve means to seal said opening and thereafter will generate heat in said reservoir which will cause a thermal expansion of the gases in the sealed enclosure to allow a portion of the gas to escape into the crankcase through said conduit means in opposition to the lubricant therein, said fluid in the reservoir responding to said thermal expansion of the gases by moving in said straight measuring tube to a level corresponding to the opposition of the lubricant to provide an indication of the level of the lubricant in the crankcase, a pressure responsive switch in ciruit with said warning light responding to the development of oil pressure in the vehicle to terminate the transmission of voltage to the resistance heating means to permit the valve to move away from the opening and allow the gases in the reservoir to escape to the atmosphere.

B 471,735

POSITIONING DEVICE FOR A TURBINE ROTOR POSITION SENSOR

Karl O. Jaegtnes, Aston, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 20, 1974, Ser. No. 471,735

Int. Cl.² F01D 21/04, 21/06

U.S. Cl. 415—14 4 Claims

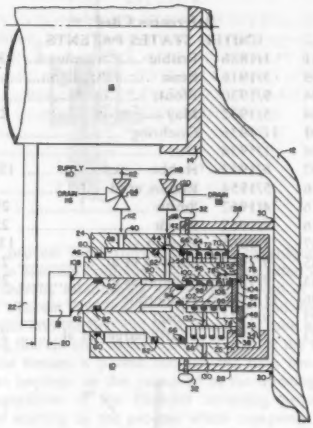
References Cited

UNITED STATES PATENTS

2,888,023	5/1959	Eggenberger	415/14
3,002,374	10/1961	Jacobs	415/118
3,100,001	8/1963	Forwald	92/65
3,603,207	9/1971	Parrett	91/173
3,861,818	1/1975	Eggenberger	415/118

FOREIGN PATENTS OR APPLICATIONS

1,249,883	9/1967	Germany	415/13
1,141,462	12/1962	Germany	73/37.5
1,473,798	6/1969	Germany	73/37.5



1. A device for positioning a turbine rotor position sensor, said snesor monitoring the location and detecting axial movement of a rotor member disposed within a turbine apparatus, said device comprising:

an outer casing member,

an intermediate member surrounded by said outer casing member, said intermediate member being rectilinearly movable relative to said outer casing member,

first bias means for biasing said intermediate member toward a first position relative to said outer casing member,

a solid inner member surrounded by said intermediate member, said inner member being rectilinearly movable relative to said intermediate member, said sensor mounted on said inner member,

second bias means for biasing said inner member toward a first position relative to said intermediate member, said sensor securely affixed to said inner member, said sensor being disposed a predetermined distance from said rotor member,

first displacement means for displacing said intermediate member from said first position relative to said outer casing member to a second position relative to said outer casing member, said inner member remaining in said first position relative to said intermediate member during said displacement of said intermediate member relative to said outer casing member, said predetermined distance between said sensor and said rotor member being changed

by said displacement of said intermediate member relative to said outer casing member,

second displacement means for displacing said inner member from a first position relative to said intermediate member to a second position relative to said intermediate member, said intermediate member remaining in said first position relative to said outer casing member during said displacement of said inner member relative to said intermediate member, said predetermined distance between said sensor and said rotor being changed by said displacement of said inner member relative to said intermediate member.

B 490,589

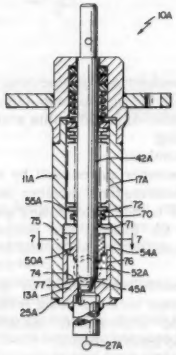
VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Arie F. Massey, Jr., Lenoir City, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 22, 1974, Ser. No. 490,589
Int. Cl.² F16K *1/00*
U.S. Cl. 251—319 **2 Claims**

References Cited
UNITED STATES PATENTS

333,941	1/1886	Frisbie	137/533.19
1,174,959	3/1916	Bean	251/223
1,774,994	9/1930	Pfoutz	251/284
1,859,834	5/1932	May	251/335 B
2,059,991	11/1936	Goehring	251/318
2,105,754	1/1938	Otis	277/124
2,321,597	6/1943	Hobbs	137/533.31
2,678,846	5/1954	Rogers et al.	251/284
3,027,916	4/1962	Smith	251/335 R
3,027,916	4/1962	Smith	251/335 R
3,193,247	7/1965	Pool et al.	137/543.21
3,206,165	9/1965	Salmon et al.	251/335 R
3,206,165	9/1965	Salmon et al.	251/335 R
3,286,736	11/1966	Guillermic	251/333
3,605,793	9/1971	Kinsel	251/333
3,787,023	1/1974	Shufflebarger et al.	251/335 B



1. A valve construction comprising a housing means having an inlet and an outlet interconnected together by a valve seat of said housing means, and a movable valve member carried by said housing means for opening and closing said valve seat, said valve member having an elongated and integral valve stem extending from one side thereof whereby said valve member and said valve stem are one-piece, said housing means having axially spaced guide means to provide the sole means for guiding axial movement of said valve stem, said valve stem having a guide collar means thereon disposed closely adjacent said valve member and cooperating with one of said guide means of said housing means, said guide collar means extending radially outwardly from said valve stem and being larger than said valve member, said guide collar means and said one guide means of said housing means having limiting means permitting axial movement of said guide collar means relative to said one guide means while preventing rotational movement therebetween, said limiting means of said guide collar means comprising a plurality of slots in said guide collar means, said limiting means of said one guide means comprising a plurality of spline members respectively received in said slots of said guide collar means, said valve seat comprising a separate valve seat member carried by said housing means, said valve seat member carrying said spline members.

B 493,501

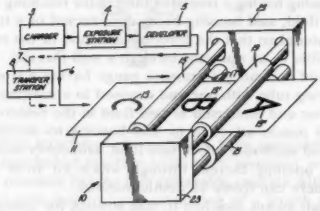
PRESSURE FIXING OF TONERS

Russell L. Root, Shaker Heights, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 1, 1974, Ser. No. 493,501
Int. Cl.² G03G *13/00*
U.S. Cl. 355—17 **4 Claims**

References Cited
UNITED STATES PATENTS

3,598,579	8/1971	Robinson	355/3
3,655,282	4/1972	Tuner et al.	355/3 FU
3,846,151	11/1974	Roteman et al.	118/637 X
3,854,975	12/1974	Brenneman	118/637 X
3,874,894	4/1975	Pedersen	355/3 DD



1. The method of providing a permanent image on a substrate, wherein the image is a fixed dry powder image of electroscopic toner powder having a predetermined threshold pressure and wherein fixing is achieved solely by the application of pressure applied to the powder image on the substrate, comprising:

the steps of creating an electrostatic charge pattern in image configuration;

depositing dry electrostatic toner powder upon said substrate to form an image pattern configuration under the electrical control of said charge pattern;

and fixing the toner power image to said substrate, wherein the last mentioned step includes:

a. applying to said imaged substrate a pressure less than said threshold pressure by means of an unheated pressure member; and

b. repeating the procedure of step a) one or more times to ultimately pressure fix said powder image upon said substrate.

B 494,806

CABLE CLAMP AND STRAIN RELIEF DEVICE

John Worrall Berkman, Thousand Oaks, Calif., and Frederic Cyrus Pexton, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

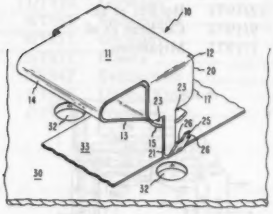
Filed Aug. 5, 1974, Ser. No. 494,806
Int. Cl.[2] F16L 3/08
U.S. Cl. 248—73 3 Claims

References Cited
UNITED STATES PATENTS

2,127,072	8/1938	Tinnerman	24/259 TF
2,201,335	5/1940	Cotter	24/73 MF
2,819,858	1/1958	Mittendorf	248/54 R
2,855,648	10/1958	Jansson	248/68 R
2,893,671	7/1959	Flora et al.	248/73
3,444,596	5/1969	Soltysik	24/73 SA

FOREIGN PATENTS OR APPLICATIONS

167,302	3/1956	Australia	24/73 SM
1,542,352	9/1968	France	24/73 SA
1,114,461	5/1968	United Kingdom	339/17 F
894,142	4/1962	United Kingdom	248/361
667,545	3/1952	United Kingdom	248/73



1. In combination with a plate member having upper and lower surfaces and a pair of spaced apertures therethrough, a cable clamp and strain relief device comprising

a body portion;

a pair of depending resilient leg members respectively disposed at and connected to opposite transverse margins of said body portion,

said leg members each having a distal end portion turned back on itself to form an acute angle with the depending portion,

said device being adapted for connection to said plate member by insertion of said depending leg member respectively through said pairs of apertures from the top surface causing said distal ends to be compressed toward said depending portion during transit through said aperture and restoring after transit through said aperture to engage the lower surface of said plate member to resist withdrawal;

said leg member turned distal end portions terminating in a rectangular central tab and adjacent shoulder portions which extend perpendicularly from each transverse side of said tab, whereby if said distal end portion is inserted sufficiently the tab underlies the lower surface of the plate member and a shoulder may underlie said lower surface when it is not possible to extend said tab portion wholly beyond said lower surface; and

a spring arm attached to said body portion along the margin thereof at one longitudinal end, formed of the material of said body portion and turned back to underlie said body portion between said leg members and compressively retain a cable disposed between said body portion and said plate member.

B 497,292

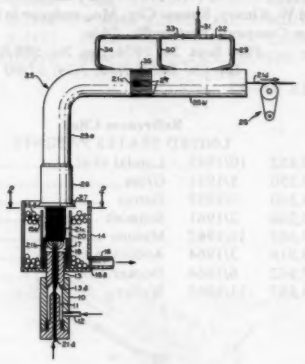
METHOD AND APPARATUS FOR TEXTURING YARN

Miguel A. Fernandez, Greenville County, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1974, Ser. No. 497,292
Int. Cl.[2] D02G 1/12
U.S. Cl. 28—1.6 2 Claims

References Cited
UNITED STATES PATENTS

3,778,872	12/1973	Newton	28/1.6
3,811,263	5/1974	Newton	28/1.6 UX



1. In a process for texturing filaments by subjecting the filaments to external crimping forces at an elevated temperature and thereby establishing an elongated wad of crimped yarn, and wherein yarn is removed from the wad, by passing the yarn wad into the first end of an elongated tube which has an opening therein intermediate the two ends of the tube and a first fluid stream is passed through the tube toward said opening to impinge on the yarn wad at the opening, during normal operation of the filament texturing process; the method of starting up the process which comprises simultaneously passing second and third fluid streams through the tube, the second fluid stream being passed through said tube toward the second end of the tube from an inlet region spaced between the first end of the tube and said opening, and the third fluid stream being passed through said tube toward the second end of the tube from an inlet region spaced between said opening and the second end of the tube, said second and third fluid streams being deactivated during noral filament operation, and said first fluid stream being deactivated during the starting up of the process.

2. In filament texturing apparatus comprising means to subject filaments to mechanical forces to form an elongated wad of crimped yarn, an elongated tube positioned so that the wad enters the first end thereof, said tube being provided with an opening intermediate the first end and a second end thereof, and first conduit means communicating with said tube between said opening and the second end of the tube to convey a first fluid stream selectively into said tube in a direction so that said first fluid stream passes through the tube toward said opening during normal operation of the filament texturing apparatus; apparatus for use in startup comprising second conduit means communicating with said tube between the first end and said opening to convey a second fluid stream selectively into said tube in a direction so that said second fluid stream passes through the tube toward said opening, and third conduit means communicating with said tube between the first end and said opening to convey a second fluid stream selectively into said tube in a direction so that said second fluid stream passes through the tube toward said opening, and third conduit means communicating with said tube between said

opening and the second end of the tube to convey a third fluid selectively into said tube in a direction so that said third fluid stream passes through the tube toward said second end, means to simultaneously activate said second and third conduit means during startup of the filament texturing apparatus and to deactivate said second and third conduit means during normal operation of said filament texturing apparatus, and means to activate said first conduit means during normal operation of said filament texturing apparatus and to deactivate said first conduit during said startup.

B 508,878

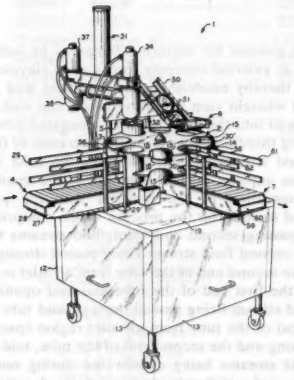
METHOD AND APPARATUS FOR FILLING CONTAINERS

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 24, 1974, Ser. No. 508,878
Int. Cl.² B65B *3/36, 3/24, 57/00*
U.S. Cl. 53—77 **11 Claims**

References Cited
UNITED STATES PATENTS

2,387,452	10/1945	Lundal et al.	141/277 X
2,553,250	5/1951	Gross	141/172 X
2,644,310	7/1953	Detrez	53/276 X
2,972,216	2/1961	Schmidt	53/281
3,064,697	11/1962	Maione	53/313 UX
3,124,916	3/1964	Anderson et al.	53/282 X
3,137,982	6/1964	Decker et al.	53/316
3,214,887	11/1965	Weller	53/316



1. An apparatus for filling containers with product such as ice cream or the like, said apparatus including:

a. a support structure;

b. a container transporting means mounted on said support structure for sequentially moving containers;

c. a container feed station adjacent said transporting means for feeding containers to said transporting means;

d. a container fill station having means for dispensing product from a source into containers moved by said transporting means, said dispensing means includes a downwardly directed nozzle with said nozzle having a pneumatically operated valve member cooperating therewith and operable to selectively close same and prevent flow of product therefrom and includes means remote from said nozzle selectively operable for dumping of product instead of filling a container;

e. a container capping station adjacent said transporting means for placing caps on said containers after same have product dispensed therein;

f. conveying means adjacent said transporting means for removing containers with caps thereon therefrom;

g. a movable platform mounted on said support structure adjacent said fill station and below said nozzle and being selectively movable toward and away from said nozzle;

h. power operated moving means mounted on said support structure and cooperating with said platform for selectively moving same; and

i. control means cooperating with said dispensing means and said moving means and operable for controlling timing of the operations thereof relative to one another, said control means is adjustable and includes an air logic circuit with a pneumatic programmer operably connected to said pneumatic valve member and said dumping means and the air logic circuit is operable for changing relative timing of the controlled operations.

B 509,586

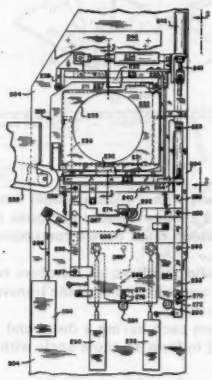
X, Y, θ ALIGNMENT MECHANISM

William H. Newell, Mount Vernon, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 26, 1974, Ser. No. 509,586
Int. Cl.² G05G *11/00*
U.S. Cl. 74—479 **10 Claims**

References Cited
UNITED STATES PATENTS

3,626,769	12/1971	Hecker et al.	74/479 X
3,691,864	9/1972	Cochran et al.	74/479
3,861,233	1/1975	Miyamoto	74/479



1. Positioning apparatus for positioning an object with respect to a fixed base comprising:

four links (**240, 254, 256, 258; 300, 332, 330, 334**) pivotally interconnected at points (**253, 255, 257, 259; 338,** 340, **337, 336**) located at the corners of a parallelogram, one link (**240, 300**) of said parallelogram supporting an object to be moved;

means to rotate a second link (**254, 332**) that is opposite said one link in said parallelogram and that is coupled to the base (**204, 202**);

means to translate said second link (**254, 332**) of said parallelogram; and

means to rotate a third link (**258, 334**) in said parallelogram, said links being interconnected with said second link (**254, 332**) so that rotation of said second link in said parallelogram rotates said object, so that translation of said second link in said parallelogram translates said object in one direction and so that rotation of said third link in said parallelogram translates said object in a direction substantially normal to said one direction.

B 511,099

RETAINING MEANS FOR EARTHWORKING TIPS

Lloyd K. Heinold, and Eugene L. Helton, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

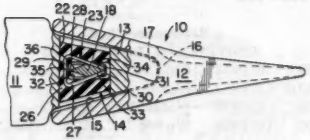
Filed Oct. 1, 1974, Ser. No. 511,099
Int. Cl.² E02F 9/28; F16B 21/07, 21/18
U.S. Cl. 37—142 A 12 Claims

References Cited
UNITED STATES PATENTS

908,429	12/1908	Tobey	85/8.8 X
968,036	8/1910	Erickson	85/8.8
1,114,123	10/1914	Dalton	85/8.8 X
2,385,565	9/1945	Cox	85/8.8 X
2,427,651	9/1947	Baer	37/142 A
2,657,482	11/1953	Laonder et al.	85/8.3 X
2,774,430	12/1956	Blazek	403/318 X
2,948,317	8/1960	Munro	85/8.8 X
2,957,717	10/1960	Bram	277/164 X
3,107,409	10/1963	Arthaud et al.	24/218
3,217,774	11/1965	Pelochino	85/8.8 X
3,410,010	11/1968	Ratkowski	37/142 A
3,445,120	5/1969	Barr	277/164
3,690,728	9/1972	Krekeler	299/92
3,740,876	6/1973	Solokhin et al.	37/142 A
3,801,210	4/1974	Heinold et al.	37/142 A X

FOREIGN PATENTS OR APPLICATIONS

2,015,662	11/1970	Germany	37/142 A
448,621	4/1968	Switzerland	85/8.8
815,428	8/1951	Germany	85/8.8
976,239	3/1951	France	85/8.8
221,075	8/1942	Switzerland	85/8.6
1,100,015	1/1968	United Kingdom	299/92
972,195	1/1951	France	37/142 A UX



1. In an earthworking device comprising a support member, a work tool mounted on a forward end of said support member, a pin having at least one pair of notches formed on opposite sides thereof and disposed in aligned apertures formed through said support member and said work tool and retaining means releasably holding said pin in said apertures, the improvement wherein said retaining means comprises an elastomeric member having said pin extending through an aperture formed therethrough and an expansible triangularly shaped and unitary spring clip comprising a base portion and a pair of leg portions cantilevered on said base portion, the ends of said leg portions remote from said base portion being exposed internally of the aperture formed through said elastomeric member and straddling opposite sides of said pin in locked engagement within the notches thereof and remaining portions of said leg portions and said base portion being totally encapsulated within said elastomeric member.

B 513,789

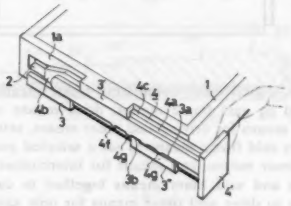
PUSH-PULL-LOCK DEVICE FOR SLIDE SHAFT

Toshiharu Koen, Yokohama, Japan, assignor to Victor Company of Japan, Limited and Nifco Inc., both of Tokyo, Japan

Filed Oct. 10, 1974, Ser. No. 513,789
Claims priority, application Japan, Oct. 11, 1973, 48-117446
Int. Cl.² F16B 7/10; F16D 1/12
U.S. Cl. 403—107 3 Claims

References Cited
UNITED STATES PATENTS

358,450	3/1887	Hurlbut	220/346
2,210,797	8/1940	Crim	403/107 X
2,434,251	1/1948	Warnke	403/107 X
2,708,026	5/1955	Duell	220/345 X
3,537,422	11/1970	Moe	220/345 X



1. A plastic device having locking means thereon to control the sliding of a plate-shaped shaft element relative to a body on which it is mounted comprising a plate-shaped shaft member, a second body member having a plurality of hook-shaped shaft guide pieces mounted along a surface on which said plate-shaped shaft member is mounted, said body member being made of an appropriate resilient plastic material, said shaft guide pieces being disposed alternately along the margins of said body member in confronting but staggered positions, said hook-shaped shaft guide pieces including upright elements and at their terminal ends in spaced relation to said body member having lips also in confronting position and extending towards each other to form a channel, said plate-shaped shaft element having an entering end and a catch surface on its opposite end, said plate-shaped shaft element adapted to be inserted in and sealed along the surfaces formed by said body member and said hook-shaped elements mounted thereon which form the channel, said plate-shaped shaft element being provided along at least one of its margins with a sawtooth projection so positioned and shaped as to permit the shaft to be slidingly inserted between said shaft guide pieces and said body member with said tooth being temporarily distorted as it passes at least one of said guide shaft pieces and thereafter returning to its normal position to provide a lock to prevent inadvertent removal, and a second set of projections on the margin of said plate-shaped shaft member consisting of a plurality of trapezoidal projections for frictional interference with the hook-shaped guide piece elements to permit positionment of said plate-shaped shaft element in any desired predetermined position.

B 516,825

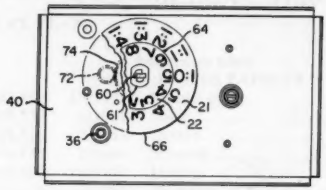
DIGITAL TIMER MEANS AND METHOD OF MAKING THE SAME

Paul T. Flumm, Oakville, and Vernon B. Harris, Waterbury, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 21, 1974, Ser. No. 516,825
Int. Cl.² G04F *3/02*
U.S. Cl. 58—21.13 **7 Claims**

References Cited
UNITED STATES PATENTS

2,593,905	4/1952	Lux	58/22.9
2,721,441	10/1955	Boyles	58/21.15 X
3,566,599	3/1971	Bassett	58/21.13 X



1. A digital timer comprising frame means, timer means carried by said frame means, drive means carried by said frame means for driving said timer means, setting means carried by said frame means to set a selected period of time of said timer means, and means for interconnecting said drive means and said timer means together to cause said drive means to drive said timer means for only said set period of time, said timer means having digital reading means for indicating the set period of time thereof, said reading means comprising two concentrically disposed different sized discs having time indicating indicia on the outer peripheries thereof, the small disc having said time indicating indicia comprising numerals from 0 to 9 to respectively represent unit minutes, the larger disc having time indicating indicia comprising numerals from 0 to 5 and 1:0 to 1:5 to respectively represent tens of minutes coupled respectively with no hours and 1 hour whereby said timer means can be set for a desired period of time between 1 minute and 1 hour and 59 minutes.

B 518,999

DEVICE FOR ROTATING A SPOOL OF A FISHING REEL

Kiyohide Kamikawa, Sakai, Japan, assignor to Shimano Industrial Company, Ltd., Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 518,999
Claims priority, application Japan, Nov. 7, 1973, 48-129409 [U]
Int. Cl.² G05G *5/06*
U.S. Cl. 74—546 **3 Claims**

References Cited
UNITED STATES PATENTS

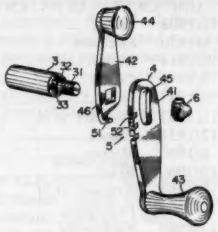
713,371	11/1902	Adams	242/84.1 J
2,107,875	2/1938	Pitney	74/546
3,011,362	12/1961	Cronholm	74/546
3,153,950	10/1964	Andrews	74/546

1. A device for rotating a spool of a fishing reel to wind a fishing line about the spool, comprising:

a. a handle stud means, connected to the spool, for rotating said spool;

b. an operating handle, mounted on one end of said handle stud means, including a first elongated handle arm and a second elongated handle arm, said first arm having at one end a handle grip and at the other end an elongated slot extending longitudinally of and through said first arm, said second arm having at one end a balance and at the other end a square hole through said second arm, said elongated slot and said square hole overlapping one another and said handle stud means extending through said slot and hole;

c. means for integrally engaging said first and second arms in a substantially straight line, said engaging means including an engageable portion formed on one of said first and second arms and a plurality of notched portions formed on the other of said first and second arms, said notched portions being spaced apart in the longitudinal direction of said other of said arms, said engageable portion being receivable in one of said notched portions; and



d. means, connected to said stud means, for fixing said operating handle to said stud means.

B 521,986

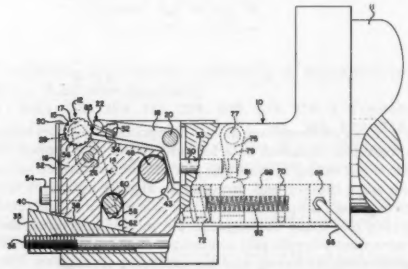
BORING BAR WITH REMOVABLE AND INDEXABLE CUTTING INSERT

Arne R. Jorgensen, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 7, 1974, Ser. No. 521,986
Int. Cl.² B23B *29/04*
U.S. Cl. 408—146 **4 Claims**

References Cited
UNITED STATES PATENTS

1,673,039	6/1928	Brown	29/98
2,630,732	3/1953	Piazze	29/98 X
3,793,708	2/1974	Watanabe et al.	29/568
3,838,500	10/1974	Wirfelt	29/568



1. A device for holding and automatically indexing a removable cutting insert comprising a plurality of cutting sections which are selectively indexable so as to successively contact the surface of a work piece being machined comprising a tool block for receiving said insert, clamp means for exerting holding pressure on said insert to hold said insert in place in said block, force means for selectively applying and removing

force on said clamp means, indexing means for indexing said cutting insert comprising engagement means for engaging said cutting insert in order to rotate said cutting insert through a predetermined angle, operating means for selectively operating said force means in order to apply or release said force on said clamp means and control means coupled to said operating means and to said indexing means and synchronized with said operating means which operates said indexing means so that said indexing means automatically acts to rotate said cutting insert only subsequent to the release of said force on said clamp means by said force means.

B 522,038

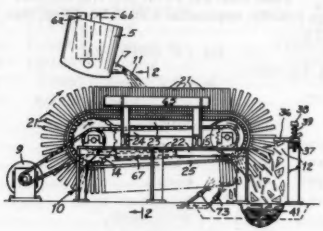
PROGRESSIVELY OR CONTINUOUSLY CYCLED MOLD FOR FORMING AND DISCHARGING A FINE CRYSTALLINE MATERIAL

John J. Scott, Niagara Falls, Canada, assignor to Norton Company, Worcester, Mass.

Filed Nov. 8, 1974, Ser. No. 522,038
Int. Cl.² B22D *5/04*
U.S. Cl. 164—330 **10 Claims**

References Cited
UNITED STATES PATENTS

805,324	11/1905	Robin-Larglois	425/6
1,469,820	10/1923	Ruby	425/453 X
1,538,425	5/1925	Debay	425/453 X
1,691,899	11/1928	Poley	425/453 X
2,952,054	9/1960	Katzman	164/330
3,436,791	4/1969	Chambon	425/453 X
3,502,136	3/1970	Parmelee et al.	164/331 X
3,645,321	2/1972	Robinson	164/324 X
3,835,917	9/1974	Gyongyos	164/279



1. In an abrasive slab casting device wherein a molten abrasive oxide material is cast between a plurality of generally vertically arranged chilling plates having opposing pairs of surfaces shaped to form a narrow abrasive receiving recess between each pair of plates, said plates being supported so they are normally free to move towards and away from each other, the improvement which comprises

plate driving means in front of a casting position moveable at a predetermined velocity and operative on a group of plates, while generally vertically arranged, to push them toward, through and beyond the casting position,

plate restraining means beyond said casting position having a surface which is moving at less than said predetermined velocity and which acts to restrain said group of plates so that adjacent pairs of plates are pressed together through and beyond said casting position to prevent leakage of molten abrasive from the narrow recesses, and

plate separating means beyond the restraining means operative to separate adjacent plates, and thereby to discharge from the narrow recess the solidified abrasive oxide material formed therebetween.

B 522,309

APPARATUS AND METHOD FOR CONVERTING MECHANICAL WAVE ENERGY TO OPTICAL ENERGY

John F. Dreyer, Cincinnati, Ohio, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

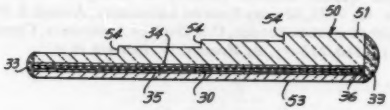
Filed Nov. 8, 1974, Ser. No. 522,309
Int. Cl.² G01N *9/24;* **G02F** *1/13*
U.S. Cl. 73—67.5 H **15 Claims**

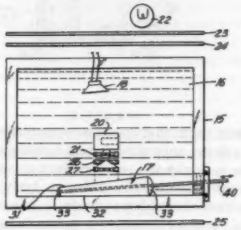
References Cited
UNITED STATES PATENTS

3,597,043	8/1971	Dreyer	350/160 LC UX
3,667,039	5/1972	Garfein et al.	350/160 LC X
3,831,434	8/1974	Greguss	73/67.5 H

OTHER PUBLICATIONS

Ludeman et al., *Liquid–Crystal Cell Having Nonuniform Thickness*, IBM Tech. Discl., Vol. 15, No. 4, Sept. 1972.





10. A method for optically detecting a pattern of wave energy comprising, in combination:

generating mechanical wave energy of particular frequencies;

directing the generated energy to an object under test and then to an optical cell responsive to mechanical wave energy of particular frequencies to produce an optical pattern, the optical cell having a liquid crystal film and first and second plate means in respective juxtaposition with opposite surfaces of the film;

varying the frequency response of the optical cell at successive portions thereof by varying the thickness of at least one of the plate means which is positioned between the wave energy generating means and said liquid crystal film and is formed with successive portions being responsive to different applied frequencies; and

detecting the optical pattern resulting from the application of mechanical wave energy to selected ones of said portions;

B 524,121
BALLISTIC INOCULATION OF ANIMALS AND PROJECTILE THEREFOR

Gerald P. Krogseng, Oakdale, and Fred R. Paul, Jr., Burnsville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

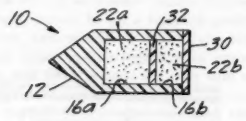
Filed Nov. 15, 1974, Ser. No. 524,121
Int. Cl.[2] A61M *5/00, 5/18, 31/00*
U.S. Cl. 128—260 **13 Claims**

References Cited
UNITED STATES PATENTS

251,355	12/1881	Gibbs	128/271
979,993	12/1910	O'Byrne et al.	102/92
2,584,166	2/1952	Stevenson et al.	128/271 X
2,617,359	11/1952	VanHorn et al.	102/92
2,854,925	10/1958	Crockford et al.	102/92
3,122,475	2/1964	Schaeppi	128/271
3,344,711	10/1967	Mawhinney et al.	102/92.4
3,429,263	2/1967	Snyder et al.	102/92 R
3,520,299	7/1970	Lott et al.	128/217
3,538,214	11/1970	Polli et al.	424/19
3,616,758	11/1971	Komarov	102/92
3,857,932	12/1974	Shepherd	424/19

OTHER PUBLICATIONS

"Final Report, Ballistic Delivery of Biological Reagents", Sept. 15, 1973, Sensory Systems Laboratory, Animal & Plant Health Inspection Service, U.S. Dept. of Agriculture, Contract 12-16-140-213-91, By Howard W. Baldwin et al.



1. A ballistic implant shaped for penetrating the epidermal covering of a living animal body and lodging totally within the tissues of the animal body, said implant consisting essentially of a biologically compatible polymer body and an antigen contained within the polymer body in a manner permitting release of said antigen in response to the fluids and cells of the living animal body.

B 526,388
PICKUP CARTRIDGE

Yoshihisa Mori, Tokyo; Kazuo Shimura, Hatogaya, and Hiroyuki Watanabe, Fujisawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1974, Ser. No. 526,388
Claims priority, application Japan, Nov. 23, 1973, 48-135377[U]
Int. Cl.[2] G11B *3/02*; **H04R** *1/16, 11/08*
U.S. Cl. 274—37 **7 Claims**

References Cited
UNITED STATES PATENTS

3,377,439	4/1968	Rouy	274/37 X

FOREIGN PATENTS OR APPLICATIONS

1,112,130	5/1968	United Kingdom	274/37

OTHER PUBLICATIONS

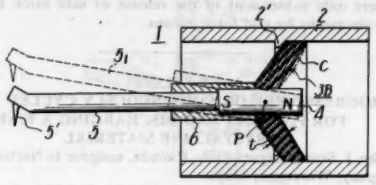
Seymour; Raymond B., Fillers for Molding Compounds, 1968, Modern Plastics Encyclopedia, p. 578.

"On the Damping of Phono Styli," by B. B. Bauer, Journal of the Audio Engineering Society, July 1964, Vol. 12, No. 3, pp. 210-213.

1. A pickup cartridge comprising:

A. vibrating means comprising a cantilever arm;

B. an elastomeric support and damper member in the form of a centrally apertured member formed as a surface of revolution and comprising two major surfaces, one generally convex and the other generally concave, said vibrating means being supported in the aperture of said member, said member extending outwardly from the axis of said arm to the outer perimeter of said member, whereby said vibrating means pivots about axes that pass transversely through said vibrating means at the region thereof grasped by the perimeter of said aperture, said region being offset to one side of a plane passing through said outer perimeter;



C. a holder for supporting said elastomeric member along said outer perimeter; and

D. fibers extending outwardly from the center of said support member along generatrices thereof providing a greater stiffness in the axial direction of the member than in a direction perpendicular thereto.

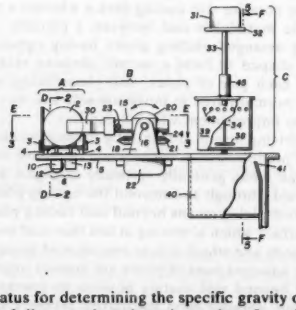
B 528,401
APPARATUS FOR MEASURING SPECIFIC GRAVITY

David Dale Appleford, Swindon, England, and David Philip King, Akron, Ohio, assignors to Monsanto Limited, London, England

Filed Nov. 29, 1974, Ser. No. 528,401
Claims priority, application United Kingdom, Nov. 28, 1973, 55075/73
Int. Cl.[2] G01N *9/08*
U.S. Cl. 73—437 **6 Claims**

References Cited
UNITED STATES PATENTS

2,623,636	12/1952	Pounds	73/432
2,650,494	9/1953	Linhorst	73/437
3,380,597	4/1968	Izetli	214/2
3,730,364	5/1973	Nattamuro et al.	198/19 X
3,747,416	7/1973	Wommack	73/437



1. Apparatus for determining the specific gravity of each of a plurality of disc- or plate-shaped samples of a solid water-insoluble material, the apparatus comprising a rack movable in its longitudinal direction and having a plurality of transverse space members for accommodating samples in mutually

spaced relationship wherein the gap between adjacent space members is sized to accept a disc- or plate-shaped sample inserted edgeways, a weight-sensing assembly by means of which the sample can be weighed first in air and then in water comprising a weight-sensing means with a sample receptacle suspended therefrom which sample receptacle includes a slot extending in the direction of the transfer mechanism adapted to receive a disc- or plate-shaped sample inserted edgeways and a reservoir operable between an upper position in which it surrounds the lower end of the sample receptacle and a lower position, and a transfer mechanism for transferring the samples, one at a time, from the rack to the weight-sensing assembly and returning each sample to the rack after the weighings on that sample are completed, comprising an arm having gripping means at one end which arm is pivoted to swing about an axis spaced from said end and pivots in a plane between the rack and the sample receptacle of the weight-sensing assembly, and wherein the transfer mechanism and the weight-sensing assembly retain the same relative positions but the rack and the transfer mechanism are relatively moveable from one to the next of a series of fixed relative positions so that the transfer mechanism can select each sample in turn for transfer to the weight-sensing assembly, and wherein in any fixed relative position of the rack and the transfer mechanism, the gap between two adjacent transverse spacer members of the rack, the arm of the transfer mechanism and the slot of the sample receptacle are substantially in alignment.

B 528,756

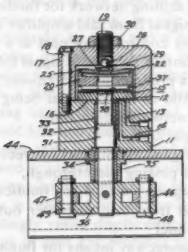
HIGH TEMPERATURE GAS CHROMATOGRAPH VALVE

Einar T. Young, Newtown Square, and Robert L. Tinklepaugh, Malvern, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Dec. 2, 1974, Ser. No. 528,756
Int. Cl.[2] G01N *1/00*; F16K *11/02*
U.S. Cl. 137—625.46 **4 Claims**

References Cited
UNITED STATES PATENTS

2,198,965	4/1940	Habig et al.	92/37 X
2,363,410	11/1944	Gill	92/37 X
3,216,326	11/1965	Rice et al.	137/625.46 X
3,223,123	12/1965	Young	137/625.46
3,329,167	7/1967	Boettcher et al.	137/625.46
3,386,338	6/1968	King	251/58 X
3,486,731	12/1969	Magnani et al.	251/58



1. A valve for injecting fluid samples into a gas chromatograph and for switching the flow directions of the gas flowing in the chromatograph, said valve designed so that it can withstand the high temperature environment in which the chromatograph is contained and to have improved sealing means to prevent gas leaks, thereby enabling more accurate chromatograph tests to be conducted, and comprising:

a. a valve body having a planar face, and having therein a plurality of fluid passages initiating from the outer circumference of the valve body and terminating on the planar face;

b. a disc member positioned adjacent to the planar face of the valve body and having a plurality of channels in the side adjacent to the valve body planar face, said channels arranged to connect selected terminal ends of the fluid passages in the valve body depending on the position of said disc member with respect to the planar face of the valve body;

c. a drive shaft which passes through the valve body and the disc member and is rotatably secured in the valve body and secured to the disc member so that the disc member can be rotated by rotating the drive shaft;

d. valve cover means, secured to the valve body, for covering the disc member and the planar face of the valve body;

e. a set screw threaded through the top of the valve cover means transversely to the planar face of the valve body, so that greater force is applied to the disc member as said set screw is rotated toward the valve body; and

f. means distributing the point force from the set screw to the outside edge of the disc member so that force is applied evenly to the entire face of the disc in contact with the valve body planar face, thereby minimizing the leakage of fluid from the valve.

B 529,836

METHOD OF RECOVERING OIL USING STEAM

Riley B. Needham, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 5, 1974, Ser. No. 529,836
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—303 **10 Claims**

References Cited
UNITED STATES PATENTS

3,207,218	9/1965	Holbrook et al.	166/305 R
3,259,186	7/1966	Dietz	166/263
3,306,354	2/1967	Obrien	166/263 X
3,354,958	11/1967	Parker	166/303
3,357,487	12/1967	Gilchrist et al.	166/245
3,396,792	8/1968	Muggee	166/303
3,412,793	11/1968	Needham	166/303 X
3,434,544	3/1969	Satter et al.	166/303
3,618,666	11/1971	Sayers	166/303
3,648,772	3/1972	Earlougher, Jr.	166/273

1. A process for increasing the efficiency of steam utilization and reducing the shut-in time in the steam stimulation of a hydrocarbon bearing formation comprising,

1. injecting into said formation through a well penetrating said formation steam in a sufficient quantity to heat substantial amounts of the hydrocarbon in said formation,

2. then injecting into said formation through said well a material which will cause the production in the formation of a condensable foam blocking zone, and

3. after the injection of step (2) putting said well into production while there is still active steam in the formation behind the material injected in step (2).

B 530,605
FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 386,389, July 18, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,605

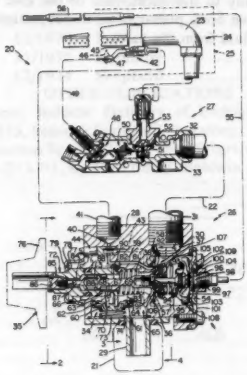
Int. Cl.² F23N *5/06, 1/00*

U.S. Cl. 137—614.11 **6 Claims**

References Cited

UNITED STATES PATENTS

2,741,266	4/1956	Grayson	137/614.11 X
3,405,869	10/1968	Grayson et al.	236/15 A
3,729,131	4/1973	McGowan	236/99



1. In a fuel control system for a fuel burning apparatus or the like having a source of fuel adapted to be interconnected by passage defining means to main burner means of said apparatus and a fuel control device disposed in said passage defining means and having poppet valve means that is directly manually operated for opening and closing said passage defining means so as to control the flow of fuel from said source to said main burner means, said control device having a selector means operatively interconnected to said poppet valve means to operate the same, said control device having throttle valve means downstream from said poppet valve means for throttling fuel flow through said passage defining means to said burner means, said selector means also being operatively interconnected to said throttle valve means to operate the same, the improvement wherein said selector means of said control device is provided with a cam means, said poppet valve means of said control device being operatively associated with said cam means of said selector means to be moved from a closed position thereof to an open position thereof as said selector means is moved between an off position thereof and a certain other position thereof in one direction and to be moved from said open position thereof to said closed position thereof as said selector means is moved between said certain other position and said off position thereof in an opposite direction to said one direction, said selector means being further movable in said one direction from said certain other position to a third position and from said third position back to said certain other position in said opposite direction, said selector means operating only said throttle valve means during its movement between said certain other position and said third position.

B 532,319
FREQUENCY MODULATED FLUIDIC GAUGE

Hansjoerg Stern, Scotia, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,319

Int. Cl.² G01B *13/02*

U.S. Cl. 73—37.7 **8 Claims**

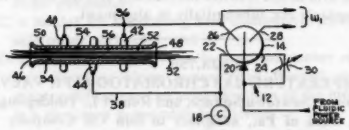
References Cited

UNITED STATES PATENTS

3,271,997	9/1966	Horne et al.	73/37.7
3,282,085	11/1966	Benson et al.	73/37.7
3,728,894	4/1973	Stern	73/37.5
3,768,303	10/1973	Rauch	73/37.7

FOREIGN PATENTS OR APPLICATIONS

1,912,329	3/1969	Germany	73/37.7



1. A fluidic gauge having no moving parts for monitoring a characteristic of a continuously moving strand-like material, comprising:

a. At least a first fluidic amplifier having a power input port for receiving fluidic power, at least one control input port and at least one output port; and

b. a fluidic phase shifting network for fluidically coupling an output fluidic signal from said amplifier output port back to said amplifier control input port at a phase angle that insures oscillation of the output signal from said amplifier output port at a predetermined frequency proportional to the characteristic of the material being monitored, said phase shifting network comprising:

1. a fluidic capacitor;

2. an enclosed gauging channel for receiving the strand-like material passing therethrough;

3. a first passageway means for fluidically coupling the output signal from said amplifier output port to said gauging channel;

4. a second passageway means for fluidically coupling at least a portion of said output signal, flowing into said gauging channel, to said fluidic capacitor and said amplifier control input port, a part of said gauging channel which receives said portion of said output signal passing between the walls of said gauging channel and the continuously moving strand-like material defines a variable fluidic resistor, whereby the combination of said amplifier and said phase shifting network comprises a first fluidic oscillator circuit having an output signal frequency which varies inversely as the product of said variable resistor and said fluidic capacitor.

B 532,476

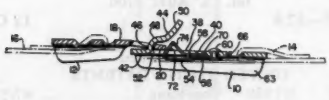
SEPARABLE FASTENER

Gustave T. Stafstrom, Plymouth, Conn., assignor to Waterbury Buckle Company, Waterbury, Conn.

Filed Dec. 13, 1974, Ser. No. 532,476
Int. Cl.² A44B *11/25, 13/02*
U.S. Cl. 24—75 6 Claims

References Cited
UNITED STATES PATENTS

237,304	2/1881	Mills	24/75
241,010	5/1881	Hayden	24/236
621,676	3/1899	Hubbard	24/265 SH
681,264	8/1901	Robinson	24/236 UX
705,620	7/1902	Specht	24/75 UX
776,229	11/1904	Fritsch	24/75
1,481,165	1/1924	Wells	24/236
1,821,839	9/1931	Kerngood	24/75
3,688,349	9/1972	Benk	24/236 X



4. A separable fastener in the form of a hook and eye type buckle, said fastener comprising: an eye member having a forward portion defining an eye, and a hook member, said hook member having a forward portion including a base of sheet material having front and back surfaces generally parallel to one another, a hook having a forward end fixed to said base and extending upwardly from said front surface and rearwardly from said forward end, said base having an opening passing therethrough and underlying said hook, and a spring detent member fixed to said base and having a portion extending into said opening and arranged to be engageable with said eye when said eye is received on said hook in a fully hooked condition to yieldingly resist displacement of said eye from said hook, said eye of said eye member including a forward transversely extending cross bar having a given dimension longitudinally of said eye member, and said hook of said hook member having a forward end portion which is directly connected to said base and which extends in a generally upward direction away from said base and an intermediate portion immediately following said forward end portion which intermediate portion extends in a generally rearward direction parallel to said base, said intermediate portion of said hook being spaced from said front surface of said base by a distance less than said longitudinal dimension of said forward cross bar of said eye so as to limit rotation of said eye member relative to said hook member when said eye is in said fully hooked condition with said hook.

B 537,722

OPTICAL DIGITAL TO ANALOG CONVERTER

Samuel Chin-Chong Tseng, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,722
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 WG 5 Claims

References Cited
UNITED STATES PATENTS

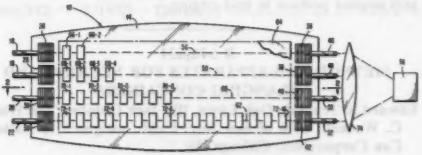
3,830,555	8/1974	Warner	350/96 WG

OTHER PUBLICATIONS

Tien et al., "Switching and Modulation of Light in Magneto-optic Waveguides of Garnet Films," Appl. Phys. Lett., Vol. 21, No. 8, 1972.

Tseng et al., "Mode Conversion in Magneto-Optic Waveguides Subjected to a Periodic Permalloy Structure," Appl. Phys. Lett., Vol. 24, No. 6, 1974.

Lean, "Optical Switch and Modulator in Parallel Waveguides," IBM Tech. Disc. Bulletin, Vol. 17, No. 4, Sept. 1974.



1. A digital to analog converter for producing an analog optical output proportional to the summation of the weighted digital values of an encoded digital signal, comprising:

a plurality of thin-film optical waveguide segments, one for each element of the digital code, operative to convert light entered thereinto from a first to a second mode and to produce as an output therefrom of both said modes, the said segments being fabricated from a magneto-optic material;

magnetic field producing means coacting with each of said segments to produce in the magnetic waveguide material thereof a periodically reversing magnetic field, whereby said periodic field in said magneto-optic material converts a portion of one mode of light to a second mode as a function of the number of field reversals, the number of said means for producing the field reversals in each segment being proportional to the weighted digital value of the codal element associated with the segment;

means responsive to a digital code element input for rendering each said segment effective to convert the light from said first mode to said second mode, and

means for obtaining the summation of the second mode light outputs from all of said segments, whereby the summation manifests the analog of the digital inputs.

B 538,472

THERMAL POWER PLANT

Pierre Henri Pacault, Ville d'Avray, France, assignor to Fives-Cail Babcock, Paris, France

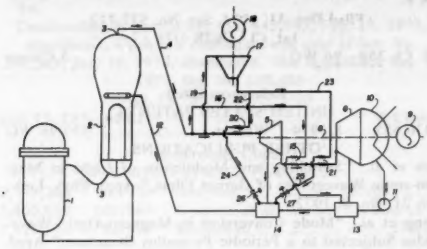
Filed Jan. 3, 1975, Ser. No. 538,472
Int. Cl.² F01K *21/00*
U.S. Cl. 60—645 14 Claims

References Cited
UNITED STATES PATENTS

1,066,348	7/1913	Voorhees	60/649
3,842,605	10/1974	Tegtmeyer	60/678

1. In a method of operating a thermal power plant in which steam at a predetermined pressure is generated in a steam generating zone, and generated steam is expanded in an en-

gine to produce mechanical work, the improvement which comprises withdrawing a first portion of the generated steam from said zone, compressing said first portion to a pressure higher than said predetermined pressure in a manner to increase the temperature of the compressed steam, and transferring thermal energy from said compressed first portion to a second portion of said generated steam prior to expanding said second portion in said engine.



B 546,631

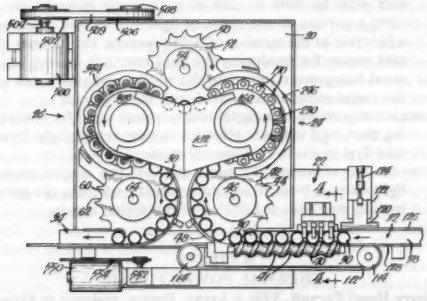
METHOD AND APPARATUS FOR NECKING AND FLANGING CONTAINERS

Edward S. Traczyk, Oak Lawn, Ill.; Jack Quinton, and Walter C. Warnell, both of San Jose, Calif., assignors to National Can Corporation, Chicago, Ill.

Filed Feb. 3, 1975, Ser. No. 546,631
Int. Cl.[2] B21D 51/26
U.S. Cl. 72—43 **50 Claims**

References Cited
UNITED STATES PATENTS

2,642,031	6/1953	Lager et al.	118/232
3,033,264	5/1962	Henrickson	113/115
3,260,089	7/1966	Hazelton et al.	113/115
3,807,209	4/1974	Aschberger	113/115
3,831,416	8/1974	Wolfe	113/1
3,857,265	12/1974	Howeler et al.	113/115



1. Apparatus for producing a reduced neck and a peripheral flange on a free edge portion of a container having a cylindrical body and an integral bottom wall comprising: a fixed frame; inlet conveyor means on said frame for receiving said containers in a vertical position and simultaneously rotating and moving said containers in a generally horizontal direction; lubricant applying means on said frame adjacent said inlet conveyor means for applying lubricant to an outer surface of said free edge portions; first transfer means for receiving the lubricated containers from said inlet conveyor means and transferring said containers to a necking station; a necking turret rotated about a vertical axis on said frame at said necking station, said turret having a plurality of necking assemblies on the periphery thereof, each necking assembly including an upper necking member and a lower support member; means at said necking station for producing relative vertical movement between said upper necking member and said support member to produce a reducing neck on said free edge portion of a container; second transfer means on said frame for receiving containers from said necking station and transferring said containers to a flanging station; a flanging turret rotated about a vertical axis on said frame at said flanging station, said flanging turret having a plurality of flanging assemblies on the periphery thereof, each flanging assembly including a lower member and an upper flanging member; means at said flanging station for simultaneously rotating said flanging member and producing vertical movement between said flanging member and said lower member; common drive means for said first and second transfer means and said turrets for producing synchronized movement of said containers; and outlet conveyor means on said frame for receiving containers from said flanging station.

B 548,028

SEED COATING

Paul A. Lewis, Salinas, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,028
Int. Cl.[2] A01C 1/06
U.S. Cl. 47—57.6 **12 Claims**

References Cited
UNITED STATES PATENTS

2,502,809	4/1950	Vogelsang	47/57.6 X
2,579,732	12/1951	Funsten et al.	47/57.6
2,656,649	10/1953	Ostier	47/57.6
2,967,376	1/1961	Scott	47/57.6
3,707,807	1/1973	Graves	47/57.6
3,808,740	5/1974	Porter et al.	47/58

7. A method of coating seeds having irregular surfaces to provide a thin coating enabling them to be processed by seed singulators and seed-tape making machines comprising:

spraying on to said seeds while the seeds are being tumbled a mixture of (1) powdered dry starch ester, and (2) polyvinyl pyrrolidone in sufficient mixture to cause the mixture to stick to the seeds and for the coating to stick to itself and (3) sufficient liquids to enable spraying.

B 548,440

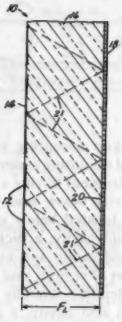
RETROREFLECTIVE MATERIAL INCLUDING GEOMETRIC FRESNEL ZONE PLATES

Wolfgang H. Strehlow, Woodbury, Minn., assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed Feb. 10, 1975, Ser. No. 548,440
Int. Cl.² G02B 5/12
U.S. Cl. 350—320 2 Claims

References Cited
UNITED STATES PATENTS

3,565,978	1/1971	Folger et al.	264/1
3,630,593	12/1971	Bartelt	350/3.5
3,746,783	7/1973	Gerritsen et al.	350/3.5



1. A method of making a retroreflective material comprising the steps of

generating an original fresnel zone plate image consisting of alternately opaque and transparent circular annuli whose radii are given by the formula

$r_n = (f\lambda n)^{1/2}$,

wherein n takes on consecutive integer values beginning with 1,

f is the focal length and λ is the wavelength of light;

recording in a photosensitive medium a photoreduced image of said original image;

changing the position of the photosensitive medium with respect to the recording means and repeating the recording step to provide an array of said photoreduced images in the photosensitive medium to define an array of fresnel zone plate images;

developing said photosensitive medium to provide an array of fresnel zone plates;

using the developed photosensitive medium to make a stamper for embossing an array of phase modulated fresnel zone plates corresponding to the array of fresnel zone plates in the developed photosensitive medium and having a given focal length associated therewith;

using said stamper to emboss transparent copy medium having a thickness equal to said given focal length to provide a said array of phase modulated fresnel zone plates at one surface of the copy medium; and

positioning a reflective surface in the back focal plane of said array of phase modulated fresnel zone plates by coating a reflective material on the opposite surface of the copy medium.

B 552,006

CERAMIC VANE ASSEMBLY WITH END CAP INSULATOR COMPOUND LOCKING JUNCTION

Claude R. Booher, Jr., West Chester, Pa., and Thomas J. Rahaim, Claymont, Del., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

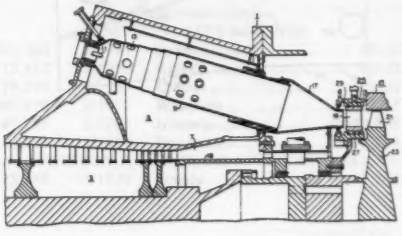
Filed Feb. 24, 1975, Ser. No. 552,006
Int. Cl.² F04D 29/02, 29/44
U.S. Cl. 415—214 12 Claims

References Cited
UNITED STATES PATENTS

890,635	6/1908	Fox	415/217
2,308,233	1/1943	Schutte	415/214
2,497,041	2/1950	Bodger	415/214
2,914,300	11/1959	Sayre	415/214
3,015,524	1/1962	Slayter et al.	415/214
3,042,366	7/1962	Holmquist	415/214
3,635,577	1/1972	Dee	415/214
3,843,279	10/1974	Crossley et al.	415/214
3,857,649	12/1974	Schaller et al.	415/214
3,867,065	2/1975	Schaller	415/214

FOREIGN PATENTS OR APPLICATIONS

846,342	8/1952	Germany	415/214



1. A ceramic vane assembly for an axial flow gas turbine, said vane assembly comprising a plurality of ceramic vanes disposed in an annular array;

radially inner and radially outer end caps having recesses disposed therein for receiving and positioning said vanes;

radially inner and radially outer insulator members disposed to engage said end caps;

said insulator members and end caps having mating surfaces which cooperate to generally prevent relative twisting and axial movement therebetween;

means for applying directed retention forces to position said vanes, end caps and insulator members in a predetermined relationship;

said engaged end caps and insulating members having a single predetermined combined thickness; and

at least one adjacent insulator member having a cross-section different from its adjacent insulator members thereby preventing said end caps from sliding circumferentially with respect to said insulator members.

B 552,932

SEMI-PNEUMATIC ENERGY ABSORBING BUMPER SYSTEM FOR MOTOR VEHICLES

Thomas A. Bank, Carmel, Ind.; Jack E. Gieck, and David A. Weitzenhof, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 426,615, Dec. 12, 1973, Pat. No. 3,902,748. This application Feb. 25, 1975, Ser. No. 552,932

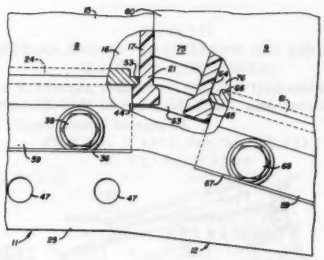
Int. Cl.[2] B60R *19/10*

U.S. Cl. 293—71 P 5 Claims

References Cited

UNITED STATES PATENTS

2,731,290	1/1956	Corydon et al.	293/71 P
3,768,850	10/1973	Barton et al.	293/71 P
3,810,668	5/1974	Kornhauser	293/71 P



5. A semi-pneumatic energy absorbing and dissipating bumper system for interposition between two objects at least one of which is movable comprising:

elastomeric module means having an impacting face, upper, lower and side walls terminating in a continuous bead;

support means for mounting said module means on at least one of said objects including

a closure plate upon which said module means is mounted and

a backup structure carrying said closure plate;

a plurality of internal reinforcing ribs connecting only said impacting face to said upper and lower walls and terminating in a rear edge the configuration of which is spaced from sealing contact with said closure plate prior to impact of said module means with an object;

means for holding at least a portion of said continuous bead against said closure plate to form a cavity therebetween closed to the atmosphere; and,

means for permitting comunication between said cavity and the atmosphere upon the application of an external force of predetermined magnitude to said module means; said means including

valve means in said closure plate opening to the atmosphere upon an increase within said module means and

a space between between at least one of said walls of said module means and said closure plate formed during impact of said module means by the escape of air from therein.

B 556,897

PICKUP MOUNTING FOR STRINGED INSTRUMENT

James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.

Filed Mar. 10, 1975, Ser. No. 556,897

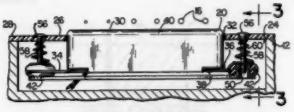
Int. Cl.[2] G10H *3/00, 3/08*

U.S. Cl. 84—1.16 7 Claims

References Cited

UNITED STATES PATENTS

2,089,171	8/1937	Beauchamp	84/1.15
2,573,254	10/1951	Fender	84/1.16
2,612,541	9/1952	DeArmond	84/1.15 X
2,921,494	1/1960	Leslie	84/1.04
3,535,968	10/1970	Rickard	84/1.15
3,668,295	6/1972	Broussard	84/1.15
3,725,561	4/1973	Paul	84/1.15



1. An electrical pickup mounting system for a stringed musical instrument, said mounting system comprising, in combination, a stringed instrument having a set of strings, a body with a top plate, a cavity below said top plate and a hole through said top plate located below said set of strings and communicating with said cavity, a pickup having a housing partially received in said cavity and extending through said opening towards said set of strings, said pickup also including at least one flange extending laterally outwardly from said housing and located in said cavity, a plurality of mounting elements of resilient material carried by said at least one flange and each having an opening facing said top plate, a plurality of screws each having a head on the outer side of said top plate and each having a threaded shank passing through said top plate and extending into the opening of a respective one of said mounting elements, means received in each of said mounting element openings for making threaded connection with the associated one of said screws, and a plurality of helical compression springs each received on a respective one of said screw shanks and compressed between said top plate and the associated one of said mounting elements.

B 557,153

MOISTURE INDICATING APPARATUS

James W. Wonn, Irwin, and Ronald L. Bannister, Glen Mills, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 10, 1975, Ser. No. 557,153

Int. Cl.[2] G01N *29/02*

U.S. Cl. 73—29 4 Claims

References Cited

UNITED STATES PATENTS

3,097,488	7/1963	Eggenberger et al.	60/660
3,580,092	5/1971	Scarpa	73/194 B
3,816,773	6/1974	Baldwin	73/194 B
3,845,660	11/1974	McDonnell	73/194 A
3,882,680	5/1975	Durrant et al.	60/646

1. A steam turbine comprising:

a casing having rotating and stationary blades therein,

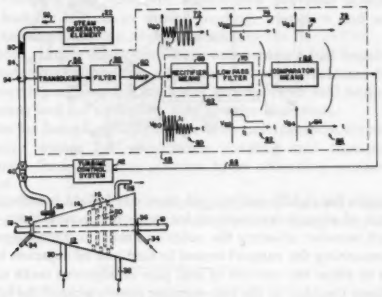
conduit means for conducting an elastic fluid vapor into and out of said casing and,

first means for detecting sonic energy produced within the conduit by the moisture, the first means being mounted on said conduit at a first predetermined location,

second means for detecting sonic energy variations produced within the conduit by the moisture, said second means being mounted on said conduit at a predetermined location spaced a predetermined distance from said first predetermined location,

means for converting the sonic energy detected by said first and said second detecting means into a first and a second electrical signal,

means for comparing the magnitude of each of said electrical signals with a predetermined magnitude and for generating a signal indicating that both electrical signals differ in magnitude from said predetermined magnitude,



means for determining the time difference between said first and said second electrical signals, and for comparing said time difference with a predetermined time value, and for generating a signal indicating the time difference between said first and said second electrical signals substantially equal said predetermined time value, and means responsive to said signals generated by said magnitude-comparing means and said time-comparing means for indicating the presence and amount of moisture droplets within said vapor flow.

B 557,299

GANG-TYPE PRODUCT KNOCKOUT AND RECEIVING MEANS

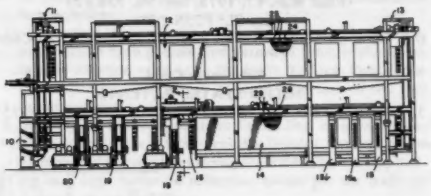
Alvin Borsuk, and Charles H. Johnson, both of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Mar. 11, 1975, Ser. No. 557,299
Int. Cl.[2] A47J 27/12
U.S. Cl. 99—355 **13 Claims**

References Cited
UNITED STATES PATENTS

3,039,136	6/1962	Toepper	99/351
3,122,243	2/1964	Hawley	99/443
3,132,950	5/1964	Macy	99/427 X
3,167,000	1/1965	Sassen	99/441 X
3,638,554	2/1972	Ackroyd	99/351
3,796,144	3/1974	Foldenauer	99/355

1. In a system for continuously making a loaf food product including a magazine of loaf molds adapted to be filled with a stuffable food material, said magazine of molds including a plurality of interconnected vertically aligned horizontally extending tubular molds, wheels connected to the molds for movably supporting the magazine on rails for movement thereof along a path transverse the longitudinal axis of the molds, each mold having a plug at one end movably positionable within and through the mold and a removable cover over the other end, means for applying heat to the molds in a cooking station for cooking the food material, and means for applying a chilling action to the molds in a chilling station for chilling the food material following cooking thereof, a product knockout and receiving means comprising a plurality of knockout bars one aligned with each mold for engaging and pushing the plug to drive the product from the removable



cover end of the molds, means driving the knockout bars in unison, and receiving means aligned with the molds for receiving the loaf food product.

B 557,621

LINE MARKER ON ICE

Robert Graff, 23 Lenox Place, Freeport, N.Y. 11520

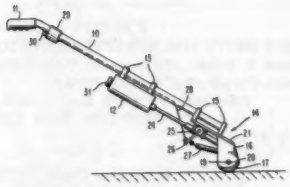
Filed Mar. 12, 1975, Ser. No. 557,621
Int. Cl. B43m 11/02
U.S. Cl. 401—219 **7 Claims**

References Cited
UNITED STATES PATENTS

2,988,763	6/1961	Sweet	401/219
3,112,512	12/1963	Arrault	401/219
3,179,298	4/1965	Collins	222/177
3,207,379	9/1965	Waldrum	222/177
3,241,175	3/1966	Johnson	401/208 X
3,453,058	7/1969	Bixel	401/219 X

FOREIGN PATENTS OR APPLICATIONS

675,298	10/1929	France	15/235 B



1. An apparatus for applying a colored liquid line on the surface of ice, which comprises a frame, a coating roller rotatably mounted in said frame, at least one skid-proof wheel rotatably mounted in said frame and having a multiplicity of small protrusions on its peripheral surface capable of digging into said ice when said wheel is rolled thereon, linkage means associated with at least one said wheel and said coating roller to transmit the rotation of the associated wheel to said coating roller while said associated wheel and said coating roller are in rolling contact with said ice, an elongate handle attached to said frame, a liquid tank fastened to said handle, a liquid distributor supported by said frame so that liquid discharging from said distributor will wet said coating roller, and a tube connecting said tank to said distributor.

B 558,813

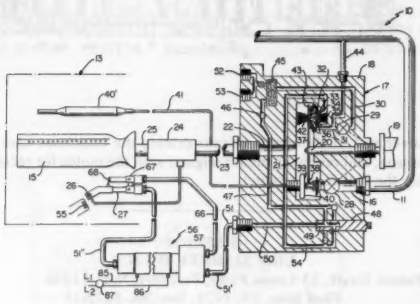
FUEL CONTROL SYSTEM AND METHOD OF OPERATING THE SAME AND DIVERTER VALVE THEREFOR

Charles D. Branson, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 17, 1975, Ser. No. 558,813
Int. Cl.² F23N *1/00*
U.S. Cl. 236—15 A **20 Claims**

References Cited
UNITED STATES PATENTS

3,780,940	12/1973	Genbauffe	236/15 A



1. In a fuel control system for a main burner having a dual rate pilot burner and a control device for providing a standby flame flow of fuel to said pilot burner when the output temperature effect of said main burner is above the temperature setting of said control device and for providing a large heater flame flow of fuel to said pilot burner when the output temperature effect of said main burner is below the temperature setting of said control device so that only said heater flame will cause a main flow of fuel to said main burner for a heating operation thereof, the improvement wherein means is provided for diverting said heater flame flow of fuel from said dual rate pilot burner to another pilot burner so that said main flow of fuel to said main burner will cease even though the output temperature effect of said main burner is below the temperature setting of said control device.

B 558,819

BELT DRIVE FOR SCRAPER ELEVATOR DEVICE

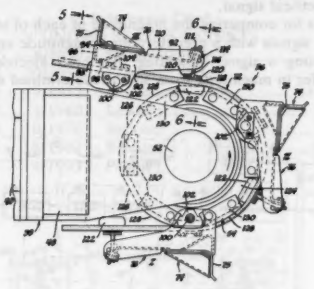
Raymond P. Dellner, Strongsville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 17, 1975, Ser. No. 558,819
Int. Cl.² B60P *1/36*; F16N *7/00*
U.S. Cl. 37—8 **3 Claims**

References Cited
UNITED STATES PATENTS

2,322,967	6/1943	Perry	74/231 C
2,803,504	8/1957	Lynch	74/231 C
2,984,120	5/1961	Hurry	74/229
3,161,280	12/1964	Creighton	198/174
3,758,966	9/1973	Miller	37/8
3,831,358	8/1974	Marsh et al.	74/231 J

1. A self-loading scraper having a tractor connected by a pull yoke to a trailing scraper bowl, an elevator device located in the scraper bowl, said elevator device comprising a frame, a drive sprocket wheel rotatably supported at the upper end of said frame, an idler sprocket wheel rotatably supported at the lower end of said frame, an endless flexible belt member having an inner surface and an outer surface, said belt member being entrained about said drive and idler sprocket wheels, a plurality of equally spaced teeth secured to the inner surface of said belt member for cooperation with the idler and sprocket wheels, a plurality of flight members, a mounting assembly connecting each of said flight members to a pair of adjacent teeth on said belt member so as to provide a plurality of equally spaced flight members along the outer surface of the belt member, said mounting assembly comprising support



means for rigidly carrying an associated flight member, and a pair of pivotal connections located on opposite sides of said belt member adjacent the outer and inner surfaces thereof for connecting the support means to said pair of adjacent teeth so as to allow the centers of said pair of adjacent teeth to move closer together as the belt member moves around the idler and the drive sprocket wheels.

B 559,954

DISPENSER FOR EXPLOSIVES HAVING ADJUSTABLE TRAP CHAMBER

William R. Van Brussel, Mt. Pleasant; Joseph C. Lestage, and Wayne J. Hartman, both of Burlington, all of Iowa, assignors to United States of America as represented by the Secretary of the Army, Washington, D.C.

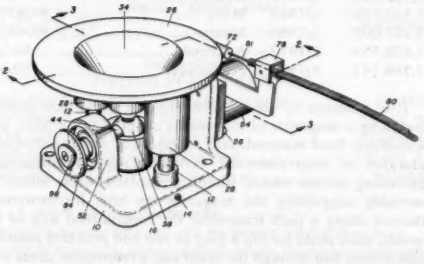
Filed Mar. 19, 1975, Ser. No. 559,954
Int. Cl.² G01F *11/00*, *11/10*
U.S. Cl. 222—306 **3 Claims**

References Cited
UNITED STATES PATENTS

774,326	11/1904	Kelly	222/306 X
2,820,577	1/1958	Winters	222/306
3,253,496	5/1966	Beach et al.	222/368 X
3,278,090	10/1966	Wahl	222/199
3,353,722	11/1967	Mehta	222/306 X

FOREIGN PATENTS OR APPLICATIONS

626,548	10/1961	Italy	222/368
571,316	1/1958	Italy	222/363



1. A ball dispenser for initiating explosives which comprises: a base casting having integral bearing housing sections positioned thereon;

a pair of vertically positioned guide rods fixedly attached to said base casting;

hopper means slidably supported on said guide rods for holding a reserve supply of an explosive powder therein which includes;

a circularly shaped flanged hopper casting having guide bosses vertically positioned thereon, said bosses having bushing bores axially positioned therein and a hyperbolically shaped feeder section having an axially positioned insert counterbore therein;

ball bushings fixedly held in said bushing bores for slidably moving on said guide rods; and

a seal insert fixedly positioned in said insert counterbore, said insert having a spherically shaped end which contacts said transport means and prevents powder leakage therefrom during loading, transport and unloading positions of said dispenser;

variable volume transport means comprising a ball housing rotatably supported in said bearing housing sections for receiving a charge of explosive powder from said hopper means and for unloading said powder therefrom;

means for funneling said powder from said transport means;

actuator means for sequentially rotating said transport means from a loading position to an unloading position; and

means for voiding said initiating explosive powders from said hopper means, said voiding means being remotely actuated.

B 561,732

METHOD OF MAKING A LIGHT ACTIVATED SEMICONDUCTOR CONTROLLED RECTIFIER

John S. Roberts, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 392,698, Aug. 29, 1973, Pat. No. 3,920,495, which is a continuation-in-part of Ser. No. 248,451, Sept. 28, 1972, abandoned. This application Mar. 25, 1975, Ser. No. 561,732

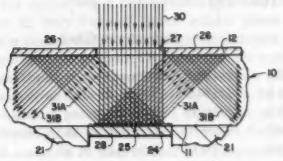
Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—578 **10 Claims**

References Cited

UNITED STATES PATENTS

2,593,447	4/1952	Hesch	252/79.3
3,088,888	5/1963	Leff	156/17
3,107,188	10/1963	Hancock	156/17
3,389,457	6/1968	Goldman	29/580
3,466,510	9/1969	Mauta	29/580



1. A method of making a light activated semiconductor controlled rectifier comprising the steps of:

A. sequentially providing in a silicon semiconductor body, having first and second opposed major surfaces, impurities to form in the body four regions of alternate type conductivity disposed alternately through the body between the major surfaces with a PN junction between each region, the two regions adjoining the major surfaces being emitter regions and the two intermediate regions being base regions;

B. masking all surfaces except first major surface of the semiconductor body with a material resistant to hydrofluoric acid;

C. preparing an etchant solution by forming a first solution by admixing predetermined amounts of chromium trioxide and water, and adding to said first solution just prior to use predetermined amounts of a given hydrofluoric acid solution;

D. immersing the masked semiconductor body in the etchant solution for a preselected period of time, while agitating the solution relative to the body, to form light radiation reflecting etch pits in at least a portion of the first major surface;

E. forming on the first major surface a first electrode making contact to the emitter region adjoining the first major surface and having an opening therethrough corresponding to a light radiation reflective means for the body on the first major surface;

F. removing from the surfaces of the semiconductor body the material resistant to hydrofluoric acid;

G. forming on the second major surface a second electrode making ohmic contact to the emitter region adjoining the second major surface and having an opening therethrough adapted to permit light radiation of preselected wavelengths to penetrate the body and reflect from the light radiation reflective means.

B 563,780

JET IGNITION ENGINE WITH VALVE-CARRIED IGNITION CHAMBER

Ming-Chih Yew, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1975, Ser. No. 563,780

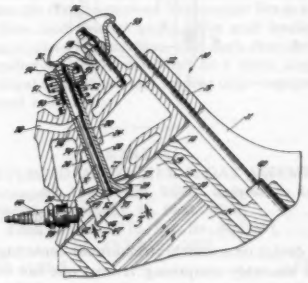
Int. Cl.[2] F02B *75/02*

U.S. Cl. 123—75 B **8 Claims**

References Cited

UNITED STATES PATENTS

942,587	12/1909	Pearson	123/108 VA
1,232,108	7/1917	Sims	123/188 AF
2,799,257	7/1957	Stampfig et al.	123/32 SP
3,382,850	5/1968	Baudry et al	123/75 B
3,881,459	5/1975	Gaetcke	123/75 B



1. An internal combustion engine comprising

means defining a variable volume main combustion chamber,

a main inlet port to said chamber

a main inlet valve closing said inlet port and operable to permit the entry of fluids to said main combustion chamber through said port,

an auxiliary ignition chamber formed on the end of said main inlet valve and extending into said main combustion chamber, said auxiliary chamber being connected with said main chamber by at least one orifice in a wall thereof,

an auxiliary inlet passage extending through said main inlet valve to said auxiliary chamber,

an auxiliary inlet valve in said main inlet valve and operable to permit the entry of fluids to said auxiliary ignition chamber through said auxiliary inlet passage,

means for cyclically opening and closing said inlet valves and

means for igniting fluids in said ignition chamber for combustion therein, with resulting expansion through said orifice to ignite fluids in said main combustion chamber.

B 567,435

CENTERING DEVICE FOR A RAIL BRAKE MAGNET UNIT

Ernst Katzer, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Apr. 11, 1975, Ser. No. 567,435

Claims priority, application Germany, Apr. 18, 1974, 2418636

Int. Cl.² F16D *65/34*; 308 *3 R*

U.S. Cl. 188—165 **6 Claims**

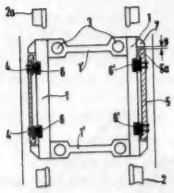
References Cited

UNITED STATES PATENTS

2,150,630	3/1934	Piron	188/165
2,570,034	10/1951	Larsen	188/165
2,617,499	11/1952	Jenkins et al.	188/165
2,966,236	12/1960	Jones	188/165
3,723,795	3/1973	Baermann	188/165

FOREIGN PATENTS OR APPLICATIONS

302,788	10/1954	Switzerland	188/165



1. A device on a vehicle structure for centering a rail brake magnet assembly comprising at least one rail brake magnet having four corners substantially rectangularly arranged on the upper portion thereof and vertically movable between a lowered operative position and a raised inoperative position, comprising means on each of the four corners for defining a slide surface thereon, each of said slide surfaces being inclined from the vertical downwardly toward a side of the magnet assembly such that transversely opposed slide surfaces on different sides of an axis of the magnet assembly are oppositely inclined, and four resilient buffers mounted on the vehicle structure and each having a plane surface engageable by said slide surfaces respectively when the rail brake magnet assembly is in its raised inoperative position to retain the magnet assembly in a fixed and centered position with respect to the said vehicle structure.

B 567,854

SELF-ALIGNING IDLER

Gene Roger Fowler, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed Apr. 14, 1975, Ser. No. 567,854

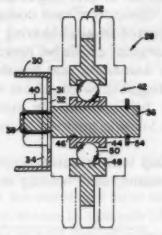
Int. Cl.² F16H *7/12*

U.S. Cl. 74—242.1 A **10 Claims**

References Cited

UNITED STATES PATENTS

1,803,186	4/1931	Hendrickson	74/242.1 A X
2,193,936	3/1940	Ostand et al.	74/242.1 A X
2,823,553	2/1958	Harrington	74/243 R
3,666,322	5/1972	Pickron	74/243 R X



1. In a drive system having an endless flexible drive element trained around rotary drive members, the combination therewith of an improved rotary idler engaging said drive element and comprising: a support; an elongated shaft having an axis extending generally parallel to the axis of the rotary drive members and having a noncircular cross section; means mounting the shaft on the support; an annular bearing having an inner race nonrotatably mounted on the shaft and axially shiftable thereon and a rotatable outer race; an outer rotary idler element connected to the outer race for rotation therewith in engagement with the drive element; and stop means operatively associated with the shaft for limiting the axial shifting of the bearing thereon.

B 569,519

SELECTIVE PLUGGING OF FORMATIONS WITH FOAM

Richard L. Clampitt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 18, 1975, Ser. No. 569,519

Int. Cl.² E21B *43/22*, *43/24*, *33/138*

U.S. Cl. 166—272 **7 Claims**

References Cited

UNITED STATES PATENTS

3,204,694	9/1965	Johnson	166/272 X
3,373,814	3/1968	Eilers et al.	166/288
3,412,793	11/1968	Needham	166/272 X
3,530,940	9/1970	Dauben et al.	166/305 R
3,682,244	8/1972	Bowman et al.	166/272 X
3,727,687	4/1973	Clampitt et al.	166/274
3,785,437	1/1974	Clampitt et al.	166/281

1. A process for improving the production of oil from an oilbearing formation by pressure of steam therein which is channeling undesirably from a steam injection well into a production well owing to channeling in said formation which comprises:

a. injecting into said channels of said formation an aqueous fluid containing a water-thickening amount of at least one crosslinkable polymeric material selected from water-dispersible polyacrylamides, cellulose ethers, and polysaccharides and a surfactant which will foam when contacted with steam, said surfactant being present in sufficient

quantities to form a stable, self-collapsing foam when said solution is contacted with steam,

b. injecting steam downwardly through the injection well and outwardly through the formation into contact with said aqueous solution in said channels thereby causing said polymeric material to be broken down by heat which then allows the steam to form a relatively stable foam having steam as the gas phase in said channels and thereby plug same and thus producing a selective blocking which forces the remaining steam to produce oil from less depleted portions of the formation, and

c. continuing to inject steam through the formation to produce oil from the less depleted portions of the formation.

B 570,172

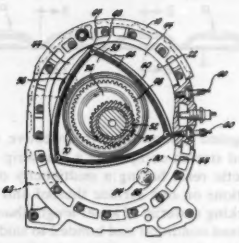
ROTARY ENGINE COMBUSTION ARRANGEMENT

Edward D. Klomp, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1975, Ser. No. 570,172
Int. Cl.² F02B 53/00
U.S. Cl. 123—8.45 **3 Claims**

References Cited
UNITED STATES PATENTS

3,854,456	12/1974	Ishii et al.	123/8.45



1. A rotary combustion engine comprising housing means having an inner peripheral wall and oppositely facing side walls, a rotor rotatably mounted in said housing means between said side walls with apexes that remain adjacent said peripheral wall as said rotor rotates, said rotor and said walls cooperatively providing a plurality of chambers spaced around said rotor that expand and contract while moving with said rotor, said housing means having an intake port openable by said rotor for delivering a combustible gaseous mixture to said chambers as they expand in an intake phase prior to contracting in a compression phase, ignition means for igniting the mixture in said chambers following their compression phase to cause their expansion in an expansion phase, said housing means having an exhaust port openable by said rotor for receiving exhaust gases from said chambers as they contract in an exhaust phase, said housing means further having a plenum, and a nozzle in one of said walls openable by said rotor for providing communication between said plenum and said chambers only as they expand during their expansion phase, said nozzle being located relative to said rotor so that said communication is initiated during the gas expansion process but after rapid combustion is complete when the pressure in said plenum is relatively low whereby on establishing said communication said plenum is charged with relatively high-pressure hot gaseous products of combustion from the connected chamber until plenum and chamber pressure are equal and thereafter on continued rotor rotation and lowering chamber pressure below plenum pressure there is caused a relatively hot gaseous jet to be discharged from said nozzle into a trailing portion of the connected chamber during the remainder of the expansion phase to enhance burning of the gases in the trailing portion during the remainder of the expansion phase and into the exhaust phase.

B 579,116

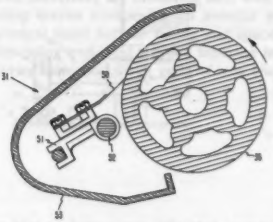
PRINTING SYSTEM HAVING A HOT ROLL FUSER WITH A SCRAPING BLADE CLEANER

Rex D. Fathergill, Frankfort; Arthur M. Howarth, and Edward L. Soard, both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1975, Ser. No. 579,116
Int. Cl.² G03G 15/00
U.S. Cl. 15—256.53 **9 Claims**

References Cited
UNITED STATES PATENTS

3,252,416	5/1966	Allen	101/425
3,520,410	7/1970	Hutto, Jr.	210/67
3,577,649	5/1971	Wadsworth et al.	15/256.51 X
3,794,417	2/1974	Machmer	355/3DD



1. A scraping cleaning apparatus for cleaning contaminating material from the surface of a roll, wherein the coefficient of friction of the roll's surface is less than the coefficient of friction of the contaminating material, the apparatus comprising:

a scraping blade having a sharp leading edge positioned to engage the advancing surface of said roll with a given force and at a critical acute angle from the tangent to the roll at the point of engagement, said critical angle being such that the friction-derived force vector lies at a greater angle than said critical angle when said leading edge engages a clean roll surface, and such that the higher friction-derived force vector lies at a lesser angle than said critical angle when said leading edge engages a contaminated roll surface.

B 583,051

SELF-STORING OUTRIGGER FLOAT ASSEMBLY

John T. Hornagold, Arden Hills, Minn., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed June 2, 1975, Ser. No. 583,051
Int. Cl.² B60S 9/02
U.S. Cl. 280—150.5 **13 Claims**

References Cited
UNITED STATES PATENTS

3,007,717	11/1961	Noly	280/150.5
3,396,854	8/1968	Crisp	212/145
3,743,108	7/1973	Visser	280/150.5
3,754,777	8/1973	Riggs	280/150.5
3,843,154	10/1974	Thompson	280/150.5
3,901,532	8/1975	Hornagold	280/150.5

1. An outrigger assembly for stabilization of a vehicle including:

an elongate, substantially horizontal outrigger beam mounted for generally horizontal movement between a

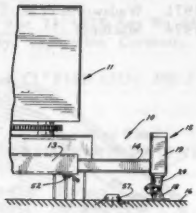
first, horizontally retracted position and a second, horizontally extended position relative to said vehicle;

a float assembly mounted on an outer end of said beam;

said float assembly including a float pad support leg, a float pad rotatably assembled at the lower end of the support leg to be movable between a generally horizontal orientation and a generally vertical orientation, and means for vertically moving the support leg between a third retracted position and a fourth extended position;

said float pad being horizontally extendible and retractible with said beam end relative to said vehicle when in the horizontal orientation to clear ground obstacles;

float pad actuator means connected to said float pad and rotatable therewith;



cam means rotatably connected to said support leg, said cam means having a first cam surface and a second cam surface, said second cam surface bearing against the float pad actuator means operative to rotate the float pad from the horizontal to the vertical orientation upon forced rotation of the cam means against the float pad actuator means; and

cam actuator means mounted on the vehicle in position to engage the first cam surface of the cam means as the float pad approaches said horizontally retracted position and said support leg approaches the vertically retracted position, and to bear against the first cam surface to force rotation of the cam means against the float pad actuator means to rotate the float pad to the vertical orientation as the float pad reaches the horizontally retracted position and said support leg reaches the vertically retracted position.

B 586,387

AROMATIC COMPOSITIONS

Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 482,776, June 24, 1974,. This application June 12, 1975, Ser. No. 586,387

Claims priority, application Switzerland, Jan. 19, 1971, 773/71; June 23, 1971, 9156/71; Jan. 11, 1972, 380/72

Int. Cl.² A24B *3/14, 13/00, 15/08*

U.S. Cl. 131—144 **6 Claims**

References Cited

UNITED STATES PATENTS

3,380,456	4/1968	Roberts et al.	131/17 R

FOREIGN PATENTS OR APPLICATIONS

138,612	10/1960	U.S.S.R.	131/144

1. A process for improving, enhancing or modifying the organoleptic properties of a tobacco product, which comprises adding thereto about 1 to about 1000 parts per million based on the weight of tobacco of at least one compound selected from the group consisting essentially of:

a. 2-hydroxy-5-methyl-acetophenone

b. 2-methyl-5-isopropenyl-anisole.

B 586,663

RETROREFLECTIVE SHEET MATERIAL WITH CONTROLLED STRETCH AND METHOD OF MAKING SAME

William P. Rowland, Southington, Conn., assignor to Reflexite Corporation, New Britain, Conn.

Filed June 13, 1975, Ser. No. 586,663

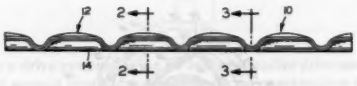
Int. Cl.² G02B *5/124*

U.S. Cl. 350—103 **5 Claims**

References Cited

UNITED STATES PATENTS

2,731,068	9/1950	Richards	308/DIG. 7
3,173,164	3/1965	Congdon	15/300 A
3,357,772	2/1963	Rowland	350/167
3,357,773	12/1964	Rowland	350/167
3,636,147	6/1972	Rowland	264/1
3,741,623	6/1973	Milalik	350/103



1. An elongated composite retroreflective sheet material with controlled stretch comprising a first strip of transparent flexible synthetic resin having a multiplicity of minute cube corner formations on one surface thereof and a second strip of flexible backing material of lesser length than said first strip when in a relaxed condition and bonded to said first strip with said cube corner formations disposed adjacent said second strip, said composite retroreflective sheet material being puckered in the relaxed condition thereof, and stretchable to a smooth surface condition with the elimination of the puckered condition providing a visual measurement of the desired degree of elongation of the composite material to avoid distortion of the cube corner formations said strips being bonded along the longitudinal edges thereof.

B 590,159

APPARATUS AND METHOD FOR FORMING CIRCULAR DYNAMOELECTRIC MACHINE FIELD WINDINGS BY PUSHING

Patrick L. Grawcock, Fort Wayne, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 473,679, May 28, 1974, abandoned. This application June 25, 1975, Ser. No. 590,159

Int. Cl.² H02K *15/04*

U.S. Cl. 140—92.1 **4 Claims**

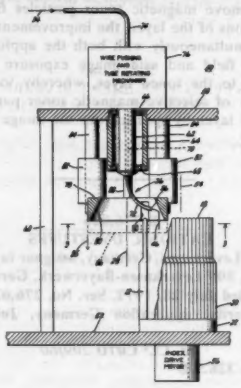
References Cited

UNITED STATES PATENTS

3,347,474	10/1967	Frank	242/1.1 R
3,514,837	6/1970	Smith	29/205 D
3,579,791	5/1971	Arnold	29/205 D
3,714,973	2/1973	Kieffer et al.	140/92.1
3,791,419	2/1974	Arick et al.	140/92.1

1. Apparatus for placing magnet wire in slots respectively defined by the blades of coil transfer apparatus which lie on an imaginary cylinder in a cylindrical array to form a circular

dynamoelectric machine field winding, said apparatus comprising means for guiding said wire toward said blades, means



for pushing wire through said guide means without applying tension thereto, and means for moving said guide means relative to said blades in a circular path which overlaps said cylindrical array of blades and which is aligned with the open ends of two of said slots whereby said wire is pushed in a direction away from the center of said path and is also pushed into said two slots; said blades respectively having distal ends and proximal ends mounted on a support member, said slots having open ends defined by said distal ends, said cylinder having a first axis, said guide means including a gun member having a dispensing end spaced from and extending generally radially with respect to a second axis which is spaced from said cylinder and parallel with said first axis, said dispensing end lying in a plane spaced from said distal ends on the side thereof remote from said support member, said moving means including means for rotating said dispensing end about said second axis whereby said dispensing end pushes said wire in said circular path, the spacing of said dispensing end from said second axis and the ratio of the speeds of said pushing and moving means being proportioned and arranged so that said path overlaps said cylinder and is aligned with said open ends of two of said slots whereby said wire is pushed into said two slots; means concentrically surrounding said dispensing end and radially spaced therefrom for confining said wire in said path; said confining means comprising an annular member having a frusto-conical inner surface facing and spaced radially from said dispensing end, said surface tapering inwardly in the direction away from said distal ends of said blades.

CHEMICAL APPLICATIONS

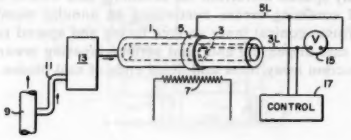
B 843,038
ELECTROCHEMICAL SENSOR FOR REACTIVE GAS MIXTURES

Yehuda L. Sandler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 18, 1969, Ser. No. 843,038
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 S **8 Claims**

References Cited
UNITED STATES PATENTS

3,216,911	11/1965	Kronenberg	204/195
3,347,767	10/1967	Hickam	204/195
3,400,054	9/1968	Ruka et al.	204/195 S
3,481,855	12/1969	Kolodney et al.	204/195
3,514,377	5/1970	Spacil et al.	204/1 T
3,597,345	8/1971	Hickam et al.	204/195 S



1. An electrochemical device for monitoring constituents of an oxygen-fuel mixture comprising, a solid electrolyte electrochemical cell having a first and second electrode disposed on opposite surfaces thereof, said first electrode has a composition exhibiting negligible catalytic action on said mixture, means for supplying a first portion of said mixture to said first electrode and a second portion of said mixture to said second electrode, said first portion of said mixture forming an oxygen reference media and said first electrode serving as an oxygen reference electrode, and catalytic means for equilibrating said second portion of said mixture, said electrochemical device generating an EMF indicative of the difference between the oxygen content of said first portion of said mixture and the equilibrated second portion of said mixture.

B 200,759
METHOD OF INCREASING THE IMAGE EXPOSURE AND DEVELOPING SENSITIVITY OF MAGNETO-ELECTRIC PRINTING SYSTEM

Edward Charles Giaimo, Jr., Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 22, 1971, Ser. No. 200,759
Int. Cl.² G03G *13/14, 13/22*
U.S. Cl. 96—1.4 **10 Claims**

References Cited
UNITED STATES PATENTS

2,756,676	7/1956	Steinhilper	96/1 R X
2,798,959	7/1957	Moncrieff-Yeates	96/1.5 X
2,924,519	2/1960	Bertelsen	96/1.4
2,968,552	1/1961	Gundlach	96/1.4
3,146,100	8/1964	Kaufman	355/17 X
3,392,642	7/1968	Germer	95/1.7

OTHER PUBLICATIONS

Translation of Japanese Patent 37–16098, 1963, 96–1R, OTS, Commerce Dept.

1. In an electrostatic printing method of the type wherein a uniform electrostatic charge is applied to a photoconductive layer, the charged layer is uniformly toned with magnetic toner particles, and the toned layer is subjected simultaneously to both a light image exposure to which the layer is sensitive and to a sub-threshold magnetic field, whereby to selectively remove magnetic toner particles from the light exposed portions of the layer, the improvement of:

applying simultaneously with both the application of said magnetic field and said image exposure a flood light exposure to the toned layer, whereby to enhance the sensitivity of selective magnetic toner particle removal from said layer by speeding up the image formation on said layer.

B 276,026
CATIONIC DYESTUFFS

Alfred Brack, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, 509 Leverkusen-Bayerwerk, Germany

Filed July 28, 1972, Ser. No. 276,026
Claims priority, application Germany, July 29, 1971, 2138029
Int. Cl.² C07D *209/60*
U.S. Cl. 260—326.5 B **10 Claims**

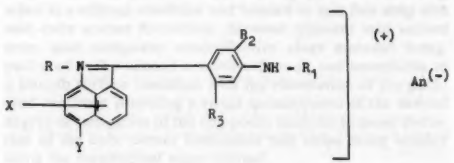
References Cited
UNITED STATES PATENTS

3,347,865	10/1967	Brack et al.	260/313.1

FOREIGN PATENTS OR APPLICATIONS

1,074,786	7/1967	United Kingdom	260/326.9

1. Cationic dyestuff having the formula



wherein

R is C_1-C_6-alkyl; cyclohexyl; benzyl; phenylethyl; phenylpropyl; phenyl; methylphenyl; methylbenzyl; allyl; ethyl substituted by nitrile, chloro, C_1-C_4-alkoxy, carboxy or C_1-C_4-alkoxycarbonyl; C_1-C_4-alkoxycarbonylmethyl; or trimethylene bonded to the naphthalene ring in the β-position;

R_1 is C_1-C_6-alkyl; cyclohexyl; benzyl; methylbenzyl; phenylethyl; allyl; or ethyl substituted by nitrile, hydroxy, C_1-C_4-alkoxy chloro or C_1-C_4-alkoxycarbonyl;

R_2 is hydroxyl; C_1-C_3-alkyl; C_1-C_4-alkoxy; benzyl; or benzyloxy;

R_3 is hydrogen; chloro; hydroxyl; methyl; C_1-C_4-alkoxy; methoxycarbonylamino; or dimethylaminocarbonylamino;

X is hydrogen; chloro; bromo; hydroxyl; ethyl; methoxy; ethoxy; acetylamino; methylamino; dimethylamino; me-

thylsulfonylamino; amidosulfonyl; dimethylaminosulfonyl; nitrile; or methylmercapto;
Y is hydrogen; chloro; or bromo.

B 302,160

PURIFICATION OF γ-OXO-2-DIBENZOFURANBUTYRIC ACID

Guenther Schilling, Westmount, and Thomas A. Dobson, Dollard-des-Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,160
Int. Cl.² C07D *307/80*
U.S. Cl. 260—346.2 M **2 Claims**

References Cited
UNITED STATES PATENTS

2,513,273	7/1950	Burtner et al.	260/515
2,569,440	10/1951	Agnew et al.	260/525
2,733,266	1/1956	McKinnis	260/525
2,773,091	12/1956	Burtner	260/515
2,813,120	11/1957	McKinnis	260/525
3,649,651	3/1972	Dobson	260/346.2

OTHER PUBLICATIONS

Keumi et al., Kogyo Kagaku Zasshi, Vol. 73, pp. 536–538, (1970).
Keumi et al., Kogyo Kagaku Zasshi, Vol. 73, pp. 2412–2421, (1970).
Patai, The Chemistry of Carboxylic Acids and Esters, pp. 897–905, (1969).
Gunther et al., J. Pharmacol, Exptl. Therap 99, No. 4, Pt. 1, pp. 465–478, 1950.
Chatterjea, J. N., Jour. Indian Chem. Soc., Vol. 33, No. 7, 1956, p. 453.

1. A process for separating γ-oxo-2-dibenzofuranbutyric acid from a mixture of said acid with γ-oxo-3-dibenzofuranbutyric acid, the γ-oxo-2-dibenzofuranbutyric acid constituting at least 80% by weight of the said mixture, which comprises
1. admixing the acid mixture with a solvent comprising methanol or ethanol;
2. esterifying the solution of the acid mixture in the presence of an acid esterification catalyst;
3. separating the ester mixture from the solution by the addition of water and/or cooling to precipitate the resulting ester mixture;
4. dissolving the ester mixture in toluene;
5. fractionally precipitating the γ-oxo-2-dibenzofuranbutyric acid ester from the toluene solution; and
6. hydrolyzing with a base the ester to provide essentially pure γ-oxo-2-dibenzofuranbutyric acid.

B 306,668

CYCLIC NITRILES AS CROSSLINKING AGENTS AND COMPOSITIONS THEREFROM

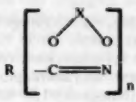
Kurt C. Frisch, Grosse Ile; Sidney L. Reegen, Oak Park, and Harry L. Bauer, Detroit, all of Mich., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 139,951, May 3, 1971, abandoned. This application Nov. 15, 1972, Ser. No. 306,668
Int. Cl. C08g *22/00*
U.S. Cl. 260—77.5 CR **8 Claims**

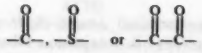
References Cited
UNITED STATES PATENTS

3,028,367	4/1962	O'Brien	260/77.5
3,245,941	4/1966	Mayer et al.	260/77.5
3,264,269	8/1966	Rees	260/77.5
3,480,595	1/1969	Burk et al.	260/77.5
3,531,425	9/1970	Burk et al.	260/77.5
3,652,507	3/1972	Burk et al.	260/77.5

1. A thermally cross-linkable coating composition comprising
A. an acrylic interpolymer having an hydroxyl number of 40 to 80 and an acid number of 5 to 15 comprised of:
1. an alkyl ester of acrylic or methacrylic acid,
2. acrylic or methacrylic acid,
3. styrene, and
4. hydroxy propyl or hydroxy ethyl methacrylate
B. a cyclic nitrile having the structure:



wherein R is an organic radical free of nucleophilic groups and having from 2 to about 200,000 carbons atoms, X is:



and *n* ranges from 2 to about 100,000,
C. a catalyst selected from:
I. a tertiary amine or
II
a. a compound of first metal or a mixture of metals selected from the metals of Groups III through V of the Periodic Table, which is soluble in the reaction mixture, and
b. a compound of second metal or a mixture of metals selected from the metals of Groups I and II and the iron series of Group VIII of the Periodic Table, which is soluble in the reaction mixture or
III. a compound of aluminum, tin, titanium, zinc, bismuth or iron which is soluble in the reaction mixture, provided that the metal is in a valence state other than zero, further provided that when the metal compound is a compound of aluminum, tin, titanium or bismuth that said contacting is in the substantial absence of metals of Groups I, II and the iron series of Group VIII of the Periodic Table, and further provided that when the metal compound is a compound of zinc or iron that said contacting is in the substantial absence of metals of Groups III through V of the Periodic Table.

B 307,698

TERTIARY AMINOACIDS AS ANTI-INFLAMMATORY AGENTS

Richard William James Carney, New Providence, and George de Stevens, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 808,343, March 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 790,863, Jan. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 757,136, Sept. 3, 1968, Pat. No. 3,657,230, which is a continuation-in-part of Ser. No. 716,347, March 27, 1968, abandoned. This application Nov. 17, 1972, Ser. No. 307,698

Int. Cl.[2] A61K *31/445*

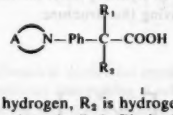
U.S. Cl. 424—267 3 Claims

References Cited

UNITED STATES PATENTS

3,558,641	1/1971	Sarett et al.	260/295
3,669,956	6/1972	Borck et al.	260/293.81
3,669,973	6/1972	Borck et al.	260/293.81
3,770,748	11/1973	Borck et al.	260/293.81

1. An antiinflammatory pharmaceutical composition comprising an antiinflammatory effective amount of a compound of the formula



in which R_1 is hydrogen, R_2 is hydrogen, lower alkyl, or 3 to 7 ring-membered cycloalkyl, Ph is 1,3- or 1,4-phenylene, (lower alkyl)-1,3- or 1,4-phenylene, (lower alkoxy)- 1,3- or 1,4-phenylene, [(lower alkylmercapto)-1,3- or 1,4-phenylene,] mono- or di-(halogeno)-1,3- or 1,4-phenylene, (trifluoromethyl)-1,3- or 1,4-phenylene, [(nitro)-1,3- or 1,4-phenylene, (amino)-1,3- or 1,4-phenylene] or (di-lower alkylamino)-1,3- or 1,4-phenylene, the group

is 5 to 8 ring-membered [mono-(hydroxy- or lower alkanoyloxy)] hydroxy-alkyleneimino, wherein the oxygen atom is separated from the nitrogen atom by at least two carbon atoms, or a lower alkyl ester, the amide, an alkali metal or alkaline earth metal salt or a therapeutically useful acid addition salt thereof, together with a pharmaceutical excipient.

B 330,736

FLUORO COMPOUND PREPARATION

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 8, 1973, Ser. No. 330,736

Int. Cl.[2] C07C *23/06*

U.S. Cl. 260—648 F 3 Claims

References Cited

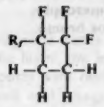
UNITED STATES PATENTS

2,957,032	10/1960	Hauptschein et al.	260/648 F
3,662,009	5/1972	Hutchinson	260/648 F
3,767,820	10/1973	Holdsworth et al.	260/648 F
3,789,088	1/1974	Lalande, Jr. et al.	260/648 F

OTHER PUBLICATIONS

Holdsworth et al., Chemical Abstracts, 77 74884*c* (1972).

1. As a new composition of matter a compound of the formula



and mixtures thereof wherein R_f is a perfluoroalkyl radical having 1–10 carbon atoms per molecule and wherein skeletal branching, if present, is no closer than the 2-position with respect to the carbon atom to which it is attached.

B 344,967

PROCESS FOR THE DYEING OF SYNTHETIC FIBRES WITH WATER-INSOLUBLE DYESTUFFS FROM ORGANIC SOLVENTS ACCORDING TO THE EXHAUSTION METHOD

William McDowell, Kelkheim, Taunus, and Rudolf Weingarten, Schwalbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 26, 1973, Ser. No. 344,967

Claims priority, application Germany, Mar. 29, 1972, 2215336

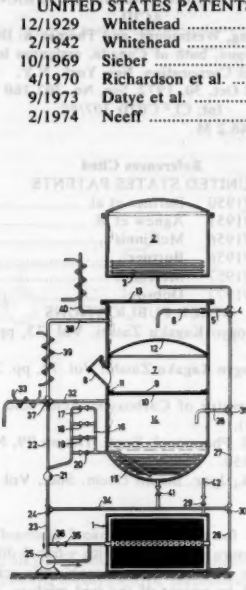
Int. Cl.[2] D06P *1/90*

U.S. Cl. 8—174 4 Claims

References Cited

UNITED STATES PATENTS

1,738,978	12/1929	Whitehead	8/59
2,273,305	2/1942	Whitehead	8/14
3,473,175	10/1969	Sieber	8/158
3,506,990	4/1970	Richardson et al.	8/174
3,758,272	9/1973	Datye et al.	8/174
3,792,971	2/1974	Neeff	8/174



1. A process for the dyeing of synthetic fibres with water-insoluble dyestuffs from organic solvents by the exhaustion method, wherein a circulating dye liquor acts upon the said synthetic fibres at elevated temperature, wherein: said dye liquor is formed by dissolving solid dyestuff from a deposit of same, in an extraction zone maintained at atmospheric pressure, with hot organic solvent; said fibres are contacted in a contact zone with said dye liquor; and the dye liquor, depleted in dyestuff, from said contact zone is recirculated to said extraction zone.

B 348,433
ANTI-INFLAMMATORY AGENTS

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 157,678, June 28, 1971, Pat. No. 3,767,653. This application Apr. 5, 1973, Ser. No. 348,433
Claims priority, application Canada, May 26, 1972, 143149
Int. Cl.² C07D *498/04*
U.S. Cl. 260—244 R 2 Claims

References Cited
UNITED STATES PATENTS

3,715,353	2/1973	Krapcho	260/244

1. A compound selected from the group consisting of 2-benzoyl-4-[3-(dimethylamino)propyl]-2H-pyrido[3,2-b][1,4]oxazin-3(4H)-one, 2-benzoyl-4-[3-(dimethylamino)-propyl]-2H-pyrido-[2,3-b][1,4]oxazin-3(4H)-one, 2-benzoyl-4-[3-(dimethylamino)propyl]-2H-pyrido]3,4-b][1,4]oxazin-3(4H)-one, and 2-benzoyl-4-[3-(dimethylamino)propyl]-2H-pyrido]4,3-b][1,4]oxazin-3(4H)-one, and pharmaceutically acceptable acid addition salts thereof.

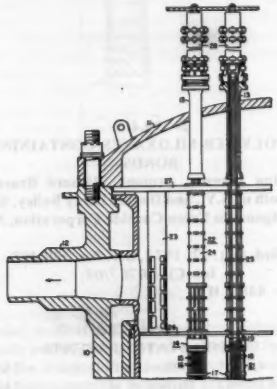
B 367,621
HYDRAULIC DRIVE FOR CONTROL RODS

Erling Frisch, deceased, late of Pittsburgh, Pa., by Dorthy Randall Frisch, Administratrix, Pittsburgh, and Harry N. Andrews, Franklin Township, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1973, Ser. No. 367,621
Int. Cl.² G21C *7/08*
U.S. Cl. 176—36 R 11 Claims

References Cited
UNITED STATES PATENTS

2,855,899	10/1958	Beaty	176/36 R
3,154,472	10/1964	Shannon	176/36 R
3,607,629	9/1971	Frisch	176/36 R



1. A nuclear reactor comprising,

a sealed, pressurized, reactor vessel having a plurality of openings in a wall thereof, each opening having a tubular member extending therethrough and sealingly attached thereto, the interior of said tubular member being exposed to the interior of said vessel,

a core fixedly positioned within said reactor vessel, said core including a multiplicity of elongated fuel elements in spaced, parallel relationship, and a multiplicity of control rod channels interspersed among said fuel elements,

means associated with said sealed reactor vessel and said core contained therein for converting heat produced by said core into useful energy,

a plurality of control rod assemblies situated for axial movement within said control rod channels, each of said control rod assemblies including at least one control rod containing neutron absorbing material and a drive shaft attached thereto, a plurality of said drive shafts extending through each of said tubular members attached to said reactor vessel,

sealed hollow hydraulic drive means sealingly attached to each of said tubular members for individually moving said drive shafts, and thereby said at least one control rod associated therewith, into and out of said core, said drive means having the interior thereof exposed to the interior of said tubular members, respectively, said drive means including a plurality of cylinders comprising cylindrical channels for respective movement therein of said control rod drive shafts, said plurality of cylinders being located within said drive means, and latching apparatus entirely within said drive means for positively and mechanically holding individual drive shafts of control rods in a withdrawn position, the ends of said drive shafts terminating within said drive means,

said latching apparatus including complementary engaging members one mounted on said drive shaft and movable to engage another engaging member mounted entirely within said drive means, said other engaging member including an elongated arm of magnetic material mounted pivotally against a resilient means and biased toward said one engaging member when the control rod associated with said one engaging member is in a withdrawn position, and actuating means for said latching apparatus positioned adjacent said latching apparatus and located on the exterior of said drive means,

said actuating means including electromagnetic pole means positioned in alignment with the elongated arm of said other engaging member to move said arm pivotally against said resilient means and away from said one engaging member when said electromagnetic pole means is energized.

B 386,257
AMIDES OF 1-AMINOCYCLOPENTANE CARBOXYLIC ACID

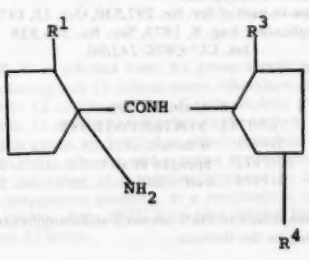
Harvey E. Alburn, West Chester, and Norman H. Grant, Wynnewood, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 209,335, Dec. 17, 1971, Pat. No. 3,803,229. This application Aug. 6, 1973, Ser. No. 386,257
Int. Cl.² C07C *103/737*
U.S. Cl. 260—557 R 1 Claim

References Cited
UNITED STATES PATENTS

3,803,229	4/1974	Alburn et al.	260/557

1. An amide of 1-aminocyclopentanecarboxylic acid of the compound having the following formula:



wherein R^1 is selected from the group consisting of hydrogen, lower alkoxy, hydroxy, lower alkyl and nitro; R^3 is selected from the group consisting of hydrogen, lower alkyl, halogen and hydroxy and R^4 is either lower alkyl or hydrogen with the proviso that R^3 is either hydroxy or hydrogen when R^4 is lower alkyl; with the further proviso that R^1, R^3 and R^4 are not all hydrogen.

B 386,673

S-(ALKOXYCARBONYL-ALKYL-THIOPHOSPHORIC ACID ESTER AMIDES

Claus Stolzer, Wuppertal; Wolfgang Behrenz, and Ingeborg Hammann, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 8, 1973, Ser. No. 386,673

Claims priority, application Germany, Aug. 16, 1972, 2240033

Int. Cl.² C07F 9/24; A01N 9/36

U.S. Cl. 260—942 **8 Claims**

References Cited

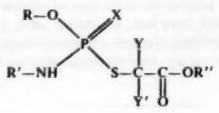
UNITED STATES PATENTS

3,019,250	1/1962	Kayser et al.	260/941 X
3,705,928	12/1972	Stolzer et al.	260/941 X

FOREIGN PATENTS OR APPLICATIONS

1,067,016	10/1959	Germany	260/941

1. An S-(alkoxycarbonyl)-alkyl-thiophosphoric acid ester amide of the formula



(I)

in which

R, R′ and R″ each independently is alkyl of 1 to 10 carbon atoms or lower alkenyl,

Y is hydrogen or lower alkyl,

Y′ is hydrogen, lower alkyl or $—CH_2—CO—OR''$, and

X is oxygen or sulfur.

B 386,828

4-ETHERS OF 3-AMINO-5-SULFAMOYLBENZOIC ACIDS

Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 297,530, Oct. 13, 1972. This application Aug. 8, 1973, Ser. No. 386,828

Int. Cl.² C07C 143/80

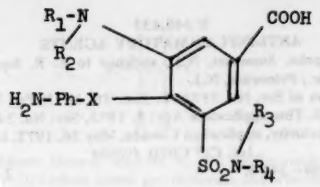
U.S. Cl. 260—516 **7 Claims**

References Cited

UNITED STATES PATENTS

3,567,714	3/1971	Wilson	260/470
3,706,790	12/1972	Sprague et al.	280/470
3,806,534	4/1974	Feit	260/519

1. A 4-phenylether of the 3-amino-5-sulfamoylbenzoic acid corresponding to the formula



in which R_1 is lower alkyl, lower alkenyl, cycloalkyl or cycloalkyl-lower alkyl each of which with 3 to 7 ringcarbon atoms, R_2 is hydrogen, lower alkyl or lower alkenyl R_3 is hydrogen or lower alkyl, X is oxygen or sulfur, Ph is unsubstituted phenylene or phenylene substituted by one member of lower alkyl, and R_4 is hydrogen or lower alkyl, or the lower alkyl esters or therapeutically useful ammonium, alkali or alkaline earth metal or acid addition salts thereof.

B 390,408

QUADRIPOLYMER SILOXANES CONTAINING SI-H BONDS

Gordon Carlton Johnson, Armonk; Richard Bruce Metzler, Ossining, both of N.Y., and Donald Leroy Bailey, Sistersville, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 22, 1973, Ser. No. 390,408

Int. Cl. C07f 7/08

U.S. Cl. 260—448.2 H **5 Claims**

References Cited

UNITED STATES PATENTS

2,547,678	4/1951	Wilcock et al.	260/448.2 H
3,065,252	11/1962	Brown et al.	260/448.2 H
3,101,361	8/1963	Brown et al.	260/448.2 H
3,280,160	10/1966	Bailey	260/448.2 H
3,334,122	8/1967	Cekada et al.	260/448.2 H
3,697,473	10/1972	Polmanteer et al.	260/448.2 H X
3,772,247	11/1973	Flannigan	260/448.2 H X

1. A quadripolymer siloxane having the average structure

$$R_3SiO(R_2SiO)_a(RHSiO)_b(H_2SiO)_cSiR_3$$

in which the sum of a + b + c is up to 175 and the ratio of b:a is from 0.1:1 to 0.35:1, the ratio of c:a is from 0.1:1 to 0.25:1 and the ratio of b:c is from 0.9:1 to 1.6:1 and R is alkyl of from 1 to 3 carbon atoms.

B 396,164

PRESSURIZED FUEL ELEMENTS FOR NUCLEAR REACTORS

Henry A. Wehrli, II, Monroeville; Edmond E. DeMario, and Thomas R. Hovanec, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

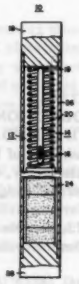
Filed Sept. 11, 1973, Ser. No. 396,164
Int. Cl.² G21C *3/04*
U.S. Cl. 176—68 9 Claims

References Cited
UNITED STATES PATENTS

3,291,698	12/1966	Fortessue	176/68
3,627,635	12/1971	Smith et al.	176/68
3,644,174	2/1972	Ferrari	176/68
3,647,622	3/1972	Andrews et al.	176/68
3,647,623	3/1972	Hepps et al.	176/79
3,671,393	6/1972	Williams	176/68
3,759,243	9/1973	Masetti	176/68

FOREIGN PATENTS OR APPLICATIONS

829,139	2/1960	United Kingdom	176/68
1,816,543	7/1970	Germany	176/68



1. A clad nuclear fuel element comprising an elongated hermetically sealed casing member, nuclear fuel occupying a portion of the interior of said casing member and the remainder of said casing member forming a gas filled plenum pressurized during manufacture with a predetermined volume of gas, at least one hermetically sealed elongated capsule having no extraneous internal support within the capsule, occupying at least a portion of the interior of said plenum out of contact with the casing member, said capsule formed with a depression in a wall of the capsule extending substantially less than the longitudinal dimension thereof, the depression controlling collapse of the capsule in a predetermined manner in a buckling mode, proportionally linearly with increases in gas generation that would result in an increase in pressure above a given designed level within said plenum due to fission gas accumulation generated under irradiation if the capsule did not collapse in a buckling mode, to provide additional volume in said plenum resulting from collapse of the capsule to the extent necessary to accommodate the increase in gas volume to maintain the pressure within said plenum substantially constant throughout the operation of the fuel element under irradiation.

B 398,084

CONVERSION OF ALIPHATIC NITRILES TO CARBOXYLIC ACIDS USING CYCLIC ACID ANHYDRIDES

Stanley D. Turk, and Charles A. Drake, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 17, 1973, Ser. No. 398,084
Int. Cl.² C07D *209/48*, *209/52*
U.S. Cl. 260—326 R 4 Claims

References Cited
UNITED STATES PATENTS

3,720,679	3/1973	Feldman et al.	260/281

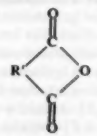
OTHER PUBLICATIONS

Komori et al., Chem. Abs. 49, 6836a(1953).
M. T. Dangyan et al., Chem. Abs. 40, 3399–1(1946).

1. A process for the simultaneous preparation of an aliphatic carboxylic acid and an imide from the corresponding aliphatic nitrile and carboxylic acid anhydride, respectively, which comprises the step of reacting said nitrile with said anhydride and water in the presence of a catalytic amount of a strong acid wherein said nitrile has the formula

$$R(CN)_n$$

wherein n is an integer having a value of 1 or 2, wherein for $n = 1$, R is selected from the group consisting of alkyl, cycloalkyl and alkenyl (said alkenyl possessing one double bond), and for $n = 2$, R is selected from the group consisting of alkylene, cycloalkylene and alkenylene (said alkenylene possessing one double bond) with the proviso that said R group contains up to 13 carbon atoms; and wherein said anhydride has the formula



wherein R' is selected from the group consisting of arylene groups having 6 or 10 carbon atoms, alkarylene groups having from 7 to 12 carbon atoms and cycloalkylene groups having from 6 to 12 carbon atoms, wherein the carbon atoms of the anhydride group are bonded to adjacent carbon atoms of the ring structure; wherein said reaction is conducted at a pressure in the range of autogenous pressure to 5000 pounds above autogenous pressure, at a temperature ranging from about 100° to about 350°C for a time ranging from about 0.5 to about 20 hours.

B 402,929
TREATMENT OF ASBESTOS DIAPHRAGMS AND RESULTING DIAPHRAGM

Robbie T. Foster; William B. Darlington, and Malcolm Korach, all of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1973, Ser. No. 402,929
Int. Cl.² C25B *13/06*; D21H *5/18*; D04H *1/58*; B05D *3/02*
U.S. Cl. 428—289 **3 Claims**

References Cited
UNITED STATES PATENTS

737,557	8/1903	Friswell	162/153
984,915	2/1911	Heltzen	117/126 AF
1,865,152	6/1932	Stuart	204/295
3,499,812	3/1970	Glar	117/126 AF
3,597,514	8/1971	Jager	162/153
3,847,762	11/1974	Stram	204/295

1. A fibrous chrysotile asbestos mat having a wet tear strength in excess of 4.4 pounds/inch and containing the reaction product formed by contacting a moist asbestos mat with alkali metal hydroxide in an aqueous alkaline solution whereby to provide alkali metal ion within the mat in an amount of from about 10 to about 100 percent of the stoichiometric amount of alkali metal ion for one equivalent of alkali metal ion to react and one equivalent of silicate ion of the asbestos, drying the asbestos to substantial dryness, and heating the dried asbestos mat to above 110°C. and below about 280°C. for more than 2 hours.

B 407,737
4-PIPERIDINOBUTYROPHENONES AS NEUROLEPTICS

Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,737
Int. Cl.² A61K *31/445*
U.S. Cl. 424—267 **3 Claims**

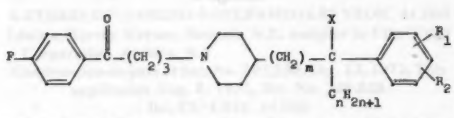
References Cited
UNITED STATES PATENTS

3,462,444	8/1969	Becket et al.	260/294.7
3,799,932	3/1974	Yamamoto et al.	260/293.6
3,806,526	4/1974	Carr et al.	260/293.64
3,852,455	12/1974	Carr	424/267

OTHER PUBLICATIONS

Chem. Abst., Vol. 70–68126w (1969).

1. A pharmaceutical composition comprising a neuroleptically effective amount of a compound of the formula



wherein X is hydroxy; *m* is 0, *n* is 1 or 2; and each of R_1 and R_2 is hydrogen, methyl, ethyl, methoxy, ethoxy, fluorine, chlorine, bromine or trifluoromethyl, or a therapeutically acceptable acid addition salt thereof, together with a pharmaceutical excipient.

B 422,063
PROCESS FOR THE PRODUCTION OF COLOURED POLYURETHANE FOAMS

Karlheinz Wolf; Konrad Nonn, both of Leverkusen; Reinhold Hörnle, Cologne; Hans Unterbirker, and Jürgen Koerner, both of Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 5, 1973, Ser. No. 422,063
Claims priority, application Germany, Dec. 5, 1972, 2259435
Int. Cl.² C08G *18/14*, *18/30*
U.S. Cl. 260—2.5 AM **8 Claims**

References Cited
UNITED STATES PATENTS

3,137,671	6/1964	Bosshard	260/2.5 AK
3,228,780	1/1966	Grelat	260/2.5 AK
3,278,486	10/1966	Meek	260/2.5 AK

FOREIGN PATENTS OR APPLICATIONS

823,089	11/1959	United Kingdom	260/2.5 AK
867,235	5/1961	United Kingdom	260/2.5 AK

OTHER PUBLICATIONS

"Evaluation of Colorants in One-Shot Urethane Foams", Olin, Bulletin 00–44U–7–65, published 7–65; pp. 1 and 2.
"Pigmentation of Flexible Urethane Foam", ICI Technical Information Bulletin, Urethane PC/U.39, Jan. 17, 1963, 9 pp.
"Daltolite Pigment Pastes for Coloring Flexible Urethane Foam", ICI Technical Inf. Bul., PC/U.53; June 22, 1964, 2 pp.

1. In a process for producing a colored polyurethane foam wherein a polyether or a polyester is reacted with an organic polyisocyanate to produce a polyurethane foam, the improvement which comprises adding to the reactants of the polyurethane foam production before or during the reaction a dispersion of one or more dyes each of which contains at least one free amino or hydroxyl group capable of reaction with isocyanates under the conditions of polyaddition and liquids in which the dyes are soluble to an extent of less than 2% at 20°C.

B 423,867

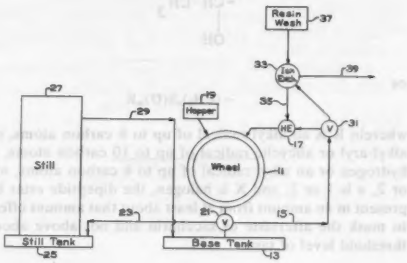
METHOD OF REMOVING HYDROGEN PEROXIDE FROM DRYCLEANING SOLVENTS

Charles L. Cormany, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1973, Ser. No. 423,867
Int. Cl.² C01B *15/02*; D06L *1/04, 1/08*
U.S. Cl. 8—142 **22 Claims**

References Cited
UNITED STATES PATENTS

2,801,224	7/1957	Greer	210/37
3,297,404	1/1967	Elliott et al.	210/37
3,679,590	1/1972	Cormany et al.	8/142



1. A method of removing minor concentrations of hydrogen peroxide from liquid chlorinated drycleaning solvents which comprises contacting a synthetic crosslinked ion-exchange resin with said solvent until said solvent has a lower hydrogen peroxide concentration.

B 426,424

METHOD FOR THE DETECTION OF FATTY SUBSTANCES ON SURFACES

Hans-Georg Rey; Walter Rittersdorf, both of Manheim-Waldhof, and Ernst-Werner Busch, Lampertheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Division of Ser. No. 219,566, Jan. 20, 1972, abandoned. This application Dec. 19, 1973, Ser. No. 426,424
Claims priority, application Germany, Feb. 11, 1971, 2106408
Int. Cl.² A61K *29/00*; G01N *13/00, 21/04*
U.S. Cl. 424—9 **9 Claims**

References Cited
UNITED STATES PATENTS

2,519,660	8/1950	James	117/36.7
2,710,263	6/1955	Clark	117/36.7
2,854,350	9/1958	Phillpotts	117/36.7
2,939,802	6/1960	Werle	117/36.7
2,957,791	10/1960	Bechtold	117/36.7
3,431,131	3/1969	Hartman	117/36.7

FOREIGN PATENTS OR APPLICATIONS

849,011	11/1939	France	424/27
1,171,869	11/1969	United Kingdom	424/9

1. Method for detecting fat or fat-like substances on a surface, which consists essentially of contacting the surface with the plastic material coated surface of a diagnostic means, thereby immediately producing a clear image of the distribution of the fat or fat-like substances on said surface, said means comprising a film, foil, or paper having a dark base color and a face coating in a thickness sufficient to mask the color of the base, said face coating comprising a finely dispersed plastic material having microporous interstices and having a white bloom, said plastic material being selected from the group consisting of cellulose butyrate, cellulose oleate, cellulose stearate, cellulose phthalate, cellulose naphthenate, cellulose laurate, cellulose acetobutyrate, cellulose acetomaleate, cellulose acetonitrate, ethyl cellulose, acetyl cellulose, benzyl cellulose, nitrocellulose, ethyl cellulose nitrate, benzyl cellulose acetate, ethyl cellulose acetate, glycol cellulose acetate, polymethacrylate and polystyrene.

B 426,639

S-TRIAZOLO-[3,4-A]ISOQUINOLINES IN TREATING INFLAMMATORY DISORDERS

Fernand G. F. Eloy, Rhode St. Genese, Belgium, and Robert W. Shanahan, Allendale, N.J., assignors to Mallinckrodt Chemical Works, now by change of name Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 164,880, July 26, 1971, abandoned. This application Dec. 12, 1973, Ser. No. 426,639
Int. Cl.² A61K *31/47, 31/495, 31/535*
U.S. Cl. 424—258 **5 Claims**

References Cited
UNITED STATES PATENTS

2,719,158	9/1955	Druey et al.	260/288 R
3,354,164	11/1967	Francis	260/288
3,663,551	5/1972	Deryckere et al.	260/283 SY

FOREIGN PATENTS OR APPLICATIONS

1,573,135	7/1969	France	260/288

1. A method of treating an inflammatory disorder in a mammal which comprises administering to said mammal an effective amount of a compound selected from the group consisting of 3-(N,N-diethylaminoethylamino)-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-6-carbomethoxy-s-triazolo-[3,4-a]-isoquinoline, 3-isobutyl-s-triazolo-[3,4-a]-isoquinoline, 8,9-methylenedioxy-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-6-methyl-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-8,9-methylenedioxy-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-9-methoxy-s-triazolo-[3,4-a]-isoquinoline, 3-methyl-9-methoxy-s-triazolo-[3,4-a]-isoquinoline, 3-methyl-8-methoxy-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-9-chloro-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-8-methoxy-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-6-carboxy-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-9-methyl-s-triazolo-[3,4-a]-isoquinoline, 3-methyl-7-cyano-s-triazolo-[3,4-a]-isoquinoline, 3-acetoxymethyl-s-triazolo-[3,4-a]-isoquinoline, 3-n-propyl-7-bromo-s-triazolo-[3,4-a]-isoquinoline, 3-methyl-7-chloro-s-triazolo-[3,4-a]-isoquinoline, 3-trifluoromethyl-5,6-dihydro-9-methoxy-s-triazolo-[3,4-a]-isoquinoline, 5,6-dihydro-8,9-methylenedioxy-s-triazolo-[3,4-a]-isoquinoline and the pharmaceutically acceptable, nontoxic acid addition and alkali metal salt thereof.

B 437,209
ANIONIC SIZES

Wulf von Bonin, Leverkusen; Friedhelm Müller, Odenthal, and Nikolaus Schön, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 28, 1974, Ser. No. 437,209
Claims priority, application Germany, Jan. 31, 1973, 2304535
Int. Cl.² C08F *222/16, 220/06*
U.S. Cl. 260—78.5 R **3 Claims**

References Cited
UNITED STATES PATENTS

3,547,898	12/1970	Shapiro	260/78.5
3,635,915	1/1972	Gale	260/78.5 R

FOREIGN PATENTS OR APPLICATIONS

674,876	7/1952	United Kingdom	260/78.5 R
1,088,634	10/1967	United Kingdom	260/78.5 R

1. A copolymer, which is suitable for use in anionic sizes, which is an ammonium or alkali metal salt of a copolymer consisting of

a. 0.5 to 50% by weight of copolymerized units of at least one half ester of an α,β-olefinically unsaturated C_4 or C_5 dicarboxylic acid and an aliphatic or cycloaliphatic alcohol having 1 to 18 C-atoms,

b. 6 to 40% by weight of copolymerized units of at least one acid selected from the group consisting of acrylic acid and methacrylic acid and

c. 40 to 85% by weight of copolymerized units of an aromatic compound which contains a single polymerizable double bond.

B 439,778
SWEETENING COMPOSITIONS

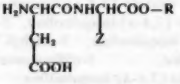
Anthony Laurence LaVia, East Brunswick, and John Anthony Hill, New Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 22,687, March 25, 1970, abandoned. This application Feb. 5, 1974, Ser. No. 439,778
Int. Cl.² A23L *1/236*
U.S. Cl. 426—548 **2 Claims**

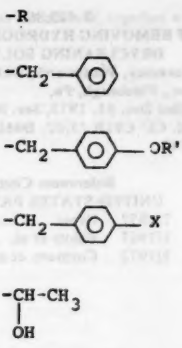
References Cited
UNITED STATES PATENTS

3,642,491	2/1972	Schlatter	426/217 X
3,695,898	10/1972	Hill et al.	426/217
3,780,189	12/1973	Scott	426/217 X

1. A method of masking the aftertaste of saccharin, which comprises adding to the saccharin a dipeptide ester of the formula



wherein Z is:



or

$$-(CH_2)_nS(O)_mR$$

wherein R is an alkyl radical of up to 6 carbon atoms, or an alkyl-aryl or alicyclic radical of up to 10 carbon atoms, R′ is hydrogen or an alkyl radical of up to 6 carbon atoms, *m* is 0 or 2, *n* is 1 or 2, and X is halogen, the dipeptide ester being present in an amount from at least about that amount effective to mask the aftertaste of saccharin and not above about its threshold level of taste.

B 440,858
BENZODIFURAN COMPOUNDS

Peter Hartmann, Cologne-Stammheim, and Hans Theidel, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Feb. 8, 1974, Ser. No. 440,858
Claims priority, application Germany, Feb. 9, 1973, 2306515
Int. Cl.² C07D *307/84*
U.S. Cl. 260—346.2 M **2 Claims**

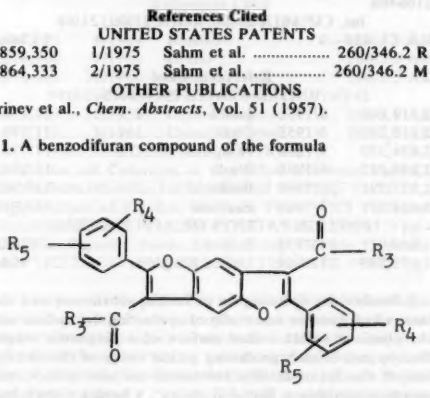
References Cited
UNITED STATES PATENTS

3,859,350	1/1975	Sahm et al.	260/346.2 R
3,864,333	2/1975	Sahm et al.	260/346.2 M

OTHER PUBLICATIONS

Grinev et al., *Chem. Abstracts*, Vol. 51 (1957).

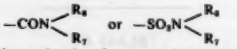
1. A benzodifuran compound of the formula



wherein:

R_3 denotes hydroxyl, alkoxy with 1 to 20 carbon atoms, cycloalkoxy with 3 to 7 carbon atoms, benzyloxy or the group

R_4 and R_5 independently of one another denote hydrogen, cyano, phenyl, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, phenoxy



R_6 and R_7 independently of one another denote hydrogen or alkyl with 1 to 4 carbon atoms, with the proviso that R_4 and R_5 do not simultaneously denote hydrogen.

B 441,605

CARBOXYLIC ACID STORAGE STABILIZERS FOR LATENT CATALYST CURED EPOXY RESINS

James D. B. Smith, Turtle Creek, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1974, Ser. No. 441,605
Int. Cl.² C08G *51/04, 30/12*
U.S. Cl. 260—37 EP **13 Claims**

References Cited
UNITED STATES PATENTS

2,844,552	7/1958	Glaser	260/2 EC
2,928,809	3/1960	Hicks	260/2 X
3,678,004	7/1972	Meyers	260/47

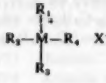
1. A resinous composition suitable for insulating electrical members comprising by weight:

A. **100** parts of an epoxy resin containing more than one **1,2** epoxy group per molecule,

B. **55** to **165** parts of an anhydride of a polycarboxylic acid as a curing agent,

C. **1** to **20** parts of a mono-carboxylic acid selected from the group consisting of acetic, propionic, butyric, isobutyric, valeric, caproic, heptanoic and hexanoic acids as a stabilizer and,

D. an effective amount of a latent catalyst selected from the group consisting of amines, imidazoles and quaternary organic onium salts having the structural formula:



where M is selected from the group consisting of N and P, R_1, R_2, R_3 and R_4 are selected from the group consisting of alkyl and aryl radicals having 1 to 21 carbon atoms and X is selected from the group consisting of halogen, propionate, acetate, butyrate, isobutyrate and dimethyl phosphate radicals.

B 447,000

PERHYDROFLUORENETETROL AND PERHYDRO-PHENANTHRENETETROL DERIVATIVES

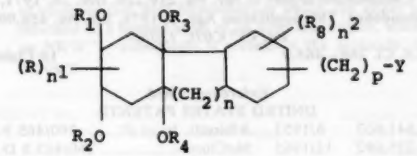
Frederic Peter Hauck, Somerville, and Christopher Michael Cimarusti, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 265,065, June 21, 1972, abandoned.
This application Feb. 28, 1974, Ser. No. 447,000
Int. Cl.² C07D *295/08, 295/10*
U.S. Cl. 260—293.56 **18 Claims**

References Cited
UNITED STATES PATENTS

3,751,420	8/1973	Hauck et al.	260/293.58

1. A compound of the structure



wherein *n* is 1 or 2; n^1 is 0, 1 or 2; n^2 is 0, 1, 2, or 3; *p* is an integer of from 0 to 10; R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, an acyl radical having less than 12 carbon atoms selected from the group consisting of lower alkanoyl, lower alkenoyl, monocyclic aroyl, monocyclic aryl-lower alkanoyl, cycloalkanoyl, cycloalkenoyl, cycloalkyl-lower alkanoyl and cycloalkenyl-lower alkanoyl, lower alkyl, trifluoromethyl, monohalo-lower alkyl, lower alkoxy-carbonyl, amido and (lower alkoxy) alkylene wherein the alkylene group has 2 to 5 carbon atoms; R is selected from the group consisting of lower alkyl, lower alkoxy, and cycloalkyl; R_8 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, di-lower alkylamino-lower alkyl, hydroxy and $R_9O(CH_2)_q$— wherein R_9 can be any of the R_1 to R_4 groups set forth above and *q* is an integer of from 1 to 10; and Y is

wherein R_5 and R_6 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halo-lower alkyl, monocyclic cycloalkyl, monocyclic cycloalkyl-lower alkyl, hydroxy-lower alkyl, monocyclic aryl or monocyclic aryl-lower alkyl; or

can be taken together to form a 5-, 6- or 7-membered nitrogen heterocyclic radical containing not more than one hetero atom in addition to the nitrogen atom, wherein said additional hetero atom may be oxygen, nitrogen, or sulfur; wherein the term cycloalkyl refers to cycloalkyl groups having 3 to 6 carbon atoms and wherein the term aryl refers to phenyl or phenyl substituted with lower alkyl, halogen, nitro, or lower alkoxy; stereoisomers thereof, acid salts thereof, quaternary salts thereof and N-oxides thereof.

B 456,900

METHOD OF PROMOTING THE REACTION OF UNSATURATED NITRILES WITH OLEFINS TO PRODUCE UNSATURATED NITRILES OF INCREASED CARBON NUMBER

Stanley D. Turk, and Charles A. Drake, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 210,228, Dec. 20, 1971, abandoned. This application Apr. 1, 1974, Ser. No. 456,900

Int. Cl.[2] C07C *120/00*

U.S. Cl. 260—465.9 **10 Claims**

References Cited

UNITED STATES PATENTS

2,641,607	6/1953	Albisetti, Jr. et al.	260/465.9 X
3,225,082	12/1965	McClure	260/465.8 D X
3,361,785	1/1968	McClure	260/465.8 D X
3,484,475	12/1969	Cornforth et al.	260/465.8 D
3,499,024	3/1970	Morita et al.	260/465.8 D X
3,567,760	3/1971	Feldman et al.	260/465.8 D
3,574,702	4/1971	Feldman et al.	260/465.8 D
3,595,901	7/1971	Smith	260/465.9
3,671,569	6/1972	Chabardes et al.	260/465.8 D

1. A method which comprises reacting under suitable reaction conditions at least one olefinic hydrocarbon compound with at least one unsaturated nitrile reactant in the presence of, as the sole reaction promoting material, a promoter consisting essentially of at least one organo derivative of a Group VA element, said reaction conditions being suitable for the reaction of said at least one olefinic hydrocarbon compound with said at least one unsaturated nitrile reactant to produce at least one unsaturated nitrile product having a greater number of carbon atoms than said unsaturated nitrile reactant;

said at least one olefinic hydrocarbon compound having from 3 to 12 carbon atoms and being represented by the formula $R_2C{=}CR{-}CHR_2$, wherein each R is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, and aryl hydrocarbyl radicals and combinations thereof;

said at least one unsaturated nitrile reactant having from 3 to 18 carbon atoms and being represented by the formula R′CH=CR′-CN wherein each R′ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, and aryl hydrocarbyl radicals and combinations thereof;

said organo derivative of a Group VA element being represented by the formula R''_nZH_{3-n} wherein each R″ is independently selected from the group consisting of aryl, alkaryl, cycloalkylaryl, araryl, aryloxy, alkaryloxy, and arylaryloxy; each R″ group containing from 6 to 12 carbon atoms; Z is selected from the group consisting of

N, P, P, As, Sb, and Bi;

and *n* is selected from the integers 2 and 3.

B 458,617

AMINO DERIVATIVES OF [4,3-C]PYRAZOLOPYRIDINE CARBOXYLIC ACIDS AND ESTERS

Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 263,566, June 16, 1972, Pat. No. 3,835,144. This application Apr. 8, 1974, Ser. No. 458,617

Int. Cl.[2] C07D *471/06*

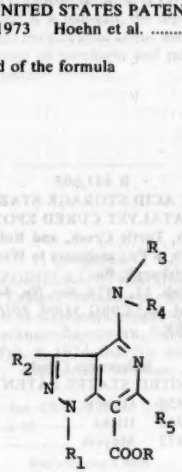
U.S. Cl. 260—295.5 B **7 Claims**

References Cited

UNITED STATES PATENTS

3,755,340	8/1973	Hoehn et al.	260/293.6

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is hydrogen, lower alkyl, phenyl or phenyl—(C_1-C_2)lower alkyl; R_2 is hydrogen, lower alkyl, phenyl or phenyl—(C_1-C_2)lower alkyl; the group

forms one of the heterocyclic groups aziridino, pyrrolidino, piperidino, piperazino, 4-lower alkylpiperazino or 4-(hydroxy-lower alkyl)piperazino; R_3 is hydrogen, lower alkyl or phenyl; and physiologically acceptable acid addition salts thereof.

B 464,587

ORGANO TIN COMPOUND

Gary L. Driscoll, Boothwyn, and Marcus W. Haseltine, Jr., Brookhaven, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 381,634, July 23, 1973, and a Continuation-in-part of Ser. No. 135,295, Apr. 19, 1971, Ser. No. 144,165, May 17, 1971, Pat. No. 3,715,313, and Ser. No. 152,203, June 11, 1971, Pat. No. 3,793,203. This application Apr. 26, 1974, Ser. No. 464,587

Int. Cl.² C07F 7/22

U.S. Cl. 260—429.7 **6 Claims**

References Cited

UNITED STATES PATENTS

2,076,201	4/1937	Langedijk et al.	260/683.15 B
2,085,535	6/1937	Langedijk et al.	260/683.15 B
2,403,779	7/1946	Bailey	260/683.15 B
3,190,901	6/1965	Polster	260/429.7
3,607,892	9/1971	Reifenberg	260/429.7

OTHER PUBLICATIONS

Chemical Abstracts, Vol. 50, 15119a (1956).
Chemical Abstracts, Vol. 54, 20326a (1960).
Bauer et al., J. Polymer Science, Part A–1, Vol. 9, pp. 1451–1458 (1971) corresponding ref. 15 on pp. 1458.
Bauer et al., Can. J. Chem. Vol. 48, pp. 1252 (1970).

1. An organo-tin compound, useful as an antiwear additive to a fuel or lubricant, recovered from the reaction product obtained by polymerization of isobutylene in the presence of from 0.1–40 volume percent of a metal halide consisting essentially of stannic chloride in a solvent selected from nitromethane, nitroethane, nitropropane, nitrobenzene, benzene, lower alkyl benzenes and mixtures of two or more said solvents at a temperature in the range of −80 to +100°C.

B 465,955

MORTAR OF INORGANIC BINDER AND FORMALDEHYDE CONDENSATION PRODUCT OF SULFONATED AROMATIC ETHER, IMINE OR SULFONE

Kurt Schaupp, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 1, 1974, Ser. No. 465,955

Claims priority, application Germany, May 5, 1973, 2322707

Int. Cl.² C08L 61/00

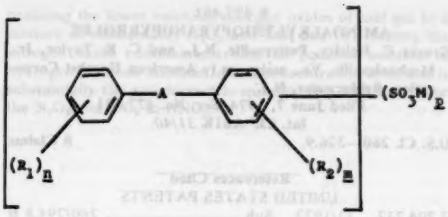
U.S. Cl. 260—37 R **7 Claims**

References Cited

UNITED STATES PATENTS

2,315,951	4/1943	Fox et al.	260/49
3,240,736	3/1966	Beckwith	260/38
3,720,529	3/1973	Jordon	106/90
3,788,868	1/1974	Kitsuda et al.	106/90

1. A mortar comprising an inorganic binder and about 0.05 to 10% of its weight of a condensation product of formaldehyde with a compound of the formula



wherein

R_1 and R_2 each independently is hydrogen, an alkyl radical with 1 to 6 carbon atoms or —NR′R″;

R′ and R″ each independently is hydrogen or an alkyl radical with 1 to 6 carbon atoms;

A is —O—, —NR′— or —SO_3—;

M is hydrogen, an alkali metal or an equivalent of an alkaline earth or earth metal;

m and *n* each independently is an integer from 1 to 5; and

p is an integer from 0 to 4;

the compound having at least one hydrogen atom capable of condensation with formaldehyde which can either be attached to a carbon atom of an aromatic ring or, where an NR′R″— substituent is present in the molecule, to nitrogen.

B 467,250

VAPORIZATION OF OIL FEED BY ADDITION OF REGENERATED CATALYST

George E. McKenna, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 6, 1974, Ser. No. 467,250

Int. Cl.² C10G 37/02, 11/04

U.S. Cl. 208—78 **9 Claims**

References Cited

UNITED STATES PATENTS

2,755,231	2/1956	Blanding et al.	208/120
3,042,196	7/1962	Payton et al.	208/113
3,186,805	6/1965	Gomory	23/288
3,380,911	4/1968	Owen	208/74
3,639,228	2/1972	Carr et al.	208/153
3,801,493	4/1974	Youngblood et al.	208/78

1. A hydrocarbon conversion process comprising:

combining a first portion of a regenerated silica-containing cracking catalyst at a temperature within the range of about 900° to 1100°F with an oil feed at a temperature of about 50° to 200°F so as to vaporize said oil feed without substantial cracking and bring said feed to a temperature within the range of about 700°–800°F;

thereafter adding additional regenerated catalyst at a temperature within the range of about 1050 to 1350°F to increase the temperature of said oil to a level within the range of about 950 to 1100°F where cracking occurs;

separating the resulting products from spent catalyst produced thereby;

recycling said spent catalyst to a regeneration zone; and

recovering said products.

B 477,481

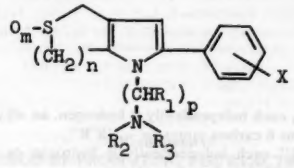
AMINOALKYLTHIOPYRANOPYRROLES

Grover C. Helsley, Pottersville, N.J., and C. R. Taylor, Jr., Mechanicsville, Va., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed June 7, 1974, Ser. No. 477,481
Int. Cl.² A61K *31/40*
U.S. Cl. 260—326.9 8 Claims

References Cited
UNITED STATES PATENTS
3,704,237 11/1972 Suh ..... 260/294.8 B

1. A compound of the formula



wherein X is hydrogen, halogen, hydroxy, lower alkyl, lower alkoxy, nitro, amino, trifluoromethyl or cyano; *m* is an integer from 0 to 2; *n* is 1, 2 or 3; *p* is 2 or 3; R_1 and R_2 are hydrogen or alkyl of 1 to 4 carbon atoms; and R_3 is alkyl of 1 to 4 carbon atoms; and the physiologically tolerable acid addition salts thereof.

B 486,280

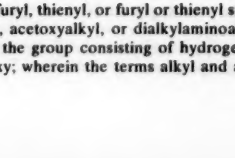
ANTHELMINTIC ISOTHIOCYANOBENZOXAZOLES

Venkatachala Lakshmi Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 259,057, June 2, 1972, abandoned.
This application July 8, 1974, Ser. No. 486,280
Int. Cl.² C07D *263/56*
U.S. Cl. 260—307 D 10 Claims

References Cited
UNITED STATES PATENTS
2,075,359 3/1937 Saltzberg et al. 424/250
3,231,596 1/1966 Knusli 260/454
3,341,564 9/1967 Potts et al. 260/454
3,342,846 9/1967 Cometti 424/302
3,558,784 1/1971 Paltauf et al. 424/302
3,586,670 6/1971 Brenneisen et al. 260/340
3,637,734 1/1972 Harnisch 260/307
FOREIGN PATENTS OR APPLICATIONS
1,453,247 8/1966 France
515,789 12/1952 Belgium
1,198,941 7/1970 United Kingdom
OTHER PUBLICATIONS
Brenneisen et al. —C. A. 78, 58423s, (1973).

1. A compound of the structure



wherein R^1 is furyl, thienyl, or furyl or thienyl substituted with alkyl, halogen, acetoxyalkyl, or dialkylaminoalkyl, and R^2 is selected from the group consisting of hydrogen, alkyl, halogen, and alkoxy; wherein the terms alkyl and alkoxy refer to groups having up to 7 carbon atoms; and a physiologically acceptable acid-addition salt thereof.

B 490,806

ELECTROSTATIC AIR CLEANER WITH AIR FLOW RESPONSIVE SWITCH

Robert L. Baysinger, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed July 22, 1974, Ser. No. 490,806
Int. Cl.² B03C *3/68*
U.S. Cl. 55—105 2 Claims

References Cited
UNITED STATES PATENTS
2,625,239 1/1953 Senne 55/217
3,372,328 3/1968 Pinckaers ..... 323/22 SC
3,395,334 7/1968 Stein ..... 323/22 SC
3,469,177 9/1969 Lorenz 323/19
3,473,101 10/1969 Muskovac 318/334
3,475,677 10/1969 Swinehart et al. ..... 307/310 X
3,486,042 12/1969 Watrous ..... 308/1 X
3,504,482 4/1970 Goettl 55/139
3,609,457 9/1971 Squiers ..... 317/13 C
3,668,373 6/1972 Laing ..... 338/25 X
3,697,863 10/1972 Kilner ..... 338/24 X
3,740,926 6/1973 Duval 55/104
3,781,839 12/1973 Bodge ..... 340/239 R
3,785,124 1/1974 Gaylord ..... 98/115 K X
3,788,041 1/1974 Gaylord 55/DIG. 36
3,794,950 2/1974 Kilner ..... 219/505 X
FOREIGN PATENTS OR APPLICATIONS
248,429 10/1963 Australia 55/105
OTHER PUBLICATIONS
"Installation Manual SC-900-C", Electro-Air Division, Emerson Electric Co., Olivia & Sproul Sts., McKees Rocks, Penn. 15136, 10 pp.

1. In an electrostatic air cleaner, an electrical power source, an air duct, an ionizing and collector unit in said air duct, an opening in the wall of said duct for the entry and removal of said unit, a casing detachably connected to said duct including a wall portion covering said opening in said duct wall, voltage step-up means and air flow responsive switching means housed in said casing, cooperating contact aperture on said unit and on said casing wall portion providing electrical connections between said voltage step-up means and said unit, an aperture in said casing wall portion, said air flow responsive switching means comprising a controlled solid state switch operative when gated to connect said voltage step-up means across said power source, gating circuit means for said switch including a temperature variable resistor connected across said switch, said resistor being heated by electrical current in the absence of cooling air flow to a temperature at which its resistance prevents gating of said switch, said resistor being mounted in said aperature in said casing wall portion and said casing having an opening in a wall thereof remote from said duct opening to permit induced air flow through said aperture when there is air flow through said duct, and said resistor

being cooled sufficiently by a predetermined induced air flow through said aperture to render it ineffective to prevent gating of said switch.

B 490,995

METHOD OF CONTROLLING OBESITY WITH PURIFIED ACTIVE PRINCIPLE OF FRUIT OF *SYNSEPALUM DULCIFICUM*

Robert I. Henkin, Bethesda, Md., and Eugene L. Giroux, Strasbourg, France, assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 354,098, April 24, 1973. This application July 23, 1974, Ser. No. 490,995

Int. Cl.² A61K *37/00, 35/78*

U.S. Cl. 424—177 **1 Claim**

References Cited

OTHER PUBLICATIONS

Kurihara et al.–Chem. Abst. Vol. 75 (1971) p. 1359j.

1. A method of controlling obesity which comprises orally administering to a human from about 10 to 400 μg. of the tastemodifying active principle of the fruit of the plant Synsepalum dulcificum and maintaining said active principle in the human's mouth for at least about 2 minutes, thereby providing a sweetening effect in the human's mouth lasting for a controlled time period of from about 10 minutes to about 3 hours depending upon the specific dosage administered, said sweetening effect being such that low-caloric value foodstuffs containing acids subsequently ingested by the human during said time period will taste satisfyingly sweet, said active principle having been obtained by the steps of:

a. contacting the fruit of *Synsepalum dulcificum* with a suspension of polyvinyl pyrrolidone in a basic medium;
b. filtering the suspension to obtain a supernatant containing the active principle of the fruit;
c. adding ϵ-amino caproic acid to the supernatant;
d. acidifying the supernatant to reduce the pH to the range of 6.0 – 6.5;
e. filtering the supernatant to obtain a solution of the active principle;
f. adsorbing the active principle on at least one chromatographic column, with at least one column employing a support material selected from the group consisting of cellulose and polyacrylamide-based strongly basic anion exchangers; and
g. eluting the active principle with Na_2HPO_4 to recover the active principle from the column.

B 491,455

PROCESS FOR LOWERING NITROGEN OXIDES IN EFFLUENT GASES

Rene Depommier, La Madeleine, aad Edouard Martin, Saint Cloud, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed July 24, 1974, Ser. No. 491,455

Claims priority, application France, July 30, 1973, 73.27774

Int. Cl.³ C01B *21/40*

U.S. Cl. 423—393 **6 Claims**

References Cited

UNITED STATES PATENTS

1,348,873	8/1920	Guye	423/394
3,733,393	5/1973	Couillaud et al.	423/235

FOREIGN PATENTS OR APPLICATIONS

316,735	8/1929	United Kingdom	423/393
14,902	8/1963	Japan	423/393
289,412	9/1929	United Kingdom	423/393

1. A process for reducing the level of nitrogen oxide contaminants in an industrial effluent gas, which comprises (a) oxidizing the lower valenced nitrogen oxides of said gas to a mixture of substantailly N_2O_3 and NO_2 and (b) treating the nitrogen oxide contaminants with an aqueous solution of hydrogen peroxide maintained at a concentration level that is substantially the stoichiometric quantity required to oxidize the N_2O_3 and NO_2 to HNO_3.

B 491,883

AMINO DERIVATIVES OF PYRIDO(2,3-B)PYRAZINE CARBOXYLIC ACIDS AND ESTERS

Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 25, 1974, Ser. No. 491,883

Int. Cl.² C07D *487/04*

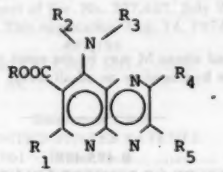
U.S. Cl. 260—250 BC **10 Claims**

References Cited

UNITED STATES PATENTS

3,180,868	4/1965	Osdeng et al.	260/250 BC

1. A compound of the formula



wherein R, R_1, R_4 and R_5 each is hydrogen or lower alkyl; R_2 and R_3 each is hydrogen, lower alkyl, lower alkanoyl, di(lower alkylamino)lower alkyl, phenyl or substituted phenyl; wherein the substituted phenyl bears one or two lower alkyl, lower alkoxy, halogen, trifluoromethyl, amino or carboxy groups; and phsiologically acceptable acid addition salts thereof.

B 494,669

TRISULFOSUCCINIC ACID

Donald R. Nielsen, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 5, 1974, Ser. No. 494,669

Int. Cl.² C07C *143/04*

U.S. Cl. 260—513 R **3 Claims**

References Cited

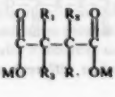
UNITED STATES PATENTS

3,138,632	6/1964	Scotti et al.	260/513 B
3,533,944	10/1970	Yuan	260/513 B
3,798,183	3/1974	Bruson et al.	260/513 B

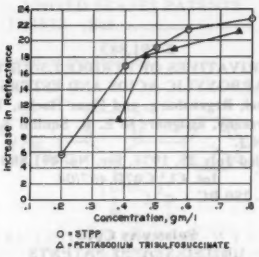
OTHER PUBLICATIONS

Beilsteins, Handbuch Der Organisch Chem. Band 4, Vierte Auflage, p. 13 (1922).

1. Trisulfosuccinic acid or its salt described by the formula:



where one of R_1, R_2, R_3 or R_4 is hydrogen and the remainder



are SO_3M; and where M may be the same or different cation selected from hydrogen or an alkali metal.

B 495,408

MIXTURE OF BENZENE-SOLUBLE AND BENZENE-INSOLUBLE CHLOROPRENE POLYMERS WHEREIN THE FORMER POLYMER IS PREPARED IN THE PRESENCE OF A DIALKOXYXANTHOGENDISULPHIDE

Rudolf Mayer-Mader, Cologne, and Jurgen Boldt, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 305,133, Nov. 9, 1972, Pat. No. 3,875,201. This application Aug. 7, 1974, Ser. No. 495,408

Claims priority, application Germany, Nov. 13, 1971, 2156453

Int. Cl.² C08f *2/46*; C08L *11/00*

U.S. Cl. 260—890 **4 Claims**

References Cited

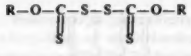
UNITED STATES PATENTS

3,147,318	9/1964	Carrerodt	260/890
3,388,188	6/1968	Strurt	260/890
3,655,827	4/1972	Finaly et al.	260/890

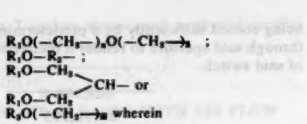
FOREIGN PATENTS OR APPLICATIONS

1,158,970	7/1969	United Kingdom	260/890

1. A mixture of a benzene-soluble chloroprene polymer and a benzene-insoluble chloroprene polymer in a weight ratio of 20:1 to 1:1 wherein the benzene-soluble chloroprene polymer is a polymer of chloroprene and up to 40% by weight, based on the monomer weight, of an α-olefin prepared by aqueous emulsion polymerization in the presence of 0.05 to 30% by weight, based on monomer weight, of an alkoxyxanthogendisulphide of the formula



wherein the R's are equal or different and each represents



R_1 is alkyl having 1 to 10 carbon atoms;

R_2 is linear or branched alkylene having 3 to 10 carbon atoms;

R_3 is alkyl having 3 to 10 carbon atoms;

n and n' are 2, 3 or 4; and

m is 1 or 2.

B 495,489

HYDROCOLLOID CONTAINING LIQUID CARRIER FOR A DIAGNOSTIC OR THERAPEUTIC AGENT

James Ling Chen, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 18,294, March 10, 1970, abandoned. This application Aug. 8, 1974, Ser. No. 495,489

Int. Cl.² A61K *47/00*

U.S. Cl. 424—362 **6 Claims**

References Cited

UNITED STATES PATENTS

2,914,443	11/1959	Lynch	424/365 X
3,004,964	10/1961	Wiegert	424/5 X
3,192,118	6/1965	Battista et al.	424/5
3,218,349	11/1965	Chapman et al.	424/5 X
3,360,436	12/1967	Felder et al.	424/5

FOREIGN PATENTS OR APPLICATIONS

606,519	12/1934	Germany	424/4
302,175	7/1968	Sweden	424/4

1. A liquid carrier for a therapeutic or diagnostic agent consisting essentially of from about 5% to about 30% by weight of a water-soluble or water-swellable hydrophilic colloid, from about 0.1% to about 10% by weight of a non-ionic wetting agent, the balance of the composition being mainly a non-aqueous water-immiscible mobile liquid, the liquid being mineral oil or a fatty acid ester of a polyhydric alcohol wherein the fatty acid has from about 12 to about 20 carbon atoms, the hydrophilic colloid being suspended in the mobile liquid.

3. A carrier according to claim 2 wherein the hydrophilic colloid is methyl cellulose and the mobile liquid is mineral oil.

B 495,550

COUMARANEDIONE-3-MONOXIMES

Hermann Oediger, Cologne, and Rudolf Braden, Odenthal-Scheuren, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 310,792, Nov. 30, 1972, Pat. No. 3,880,919. This application Aug. 8, 1974, Ser. No. 495,550

Claims priority, application Germany, Dec. 17, 1972, 2162717

Int. Cl.² C07D *493/00*

U.S. Cl. 260—343.3 R **5 Claims**

References Cited

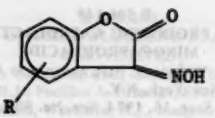
UNITED STATES PATENTS

2,473,484	6/1949	Ullyot	260/343.3

OTHER PUBLICATIONS

Wislicenus et al., Ber. V. 42, (1909), pp. 1930–1940.

1. A compound of the formula:



wherein R is hydrogen, halo or alkyl of 1 to 4 carbon atoms.

B 495,554

3-AMIDOCOUMARANONES

Hermann Oediger, Cologne, and Rudolf Braden, Odenthal-Scheuren, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 310,792, Nov. 30, 1972, Pat. No. 3,880,919. This application Aug. 8, 1974, Ser. No. 495,554

Claims priority, application Germany, Dec. 17, 1971, 2172717

Int. Cl.[2] C07D *493/00*

U.S. Cl. 260—343.3 R **5 Claims**

References Cited

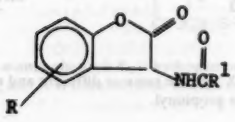
UNITED STATES PATENTS

2,473,484 6/1949 Ullyot 260/343.3

OTHER PUBLICATIONS

Wislicenus et al., Ber. V. 42, (1909), pp. 1930–1940.

1. A compound of the formula:



wherein R is hydrogen, halo or alkyl of 1 to 4 carbon atoms and R^1 is alkyl of 1 to 4 carbon atoms.

B 497,194

QUATERNARY HYDROXYALKYL TERTIARY AMINE BASES AS POLYURETHANE CATALYSTS

Ibrahim S. Bechara, Boothwyn; Felix P. Carroll, Chester; Rocco L. Mascioli, Media, all of Pa., and John R. Panchak, Wilmington, Del., assignors to Air Products and Chemicals, Inc., Wayne, Pa.

Continuation-in-part of Ser. No. 377,447, July 9, 1973, Pat. No. 3,872,687. This application Aug. 14, 1974, Ser. No. 497,194

Int. Cl.[2] C08G *18/14, 18/18*

U.S. Cl. 260—2.5 AC **11 Claims**

References Cited

UNITED STATES PATENTS

3,010,963	11/1961	Erner	260/2.5 AC
3,168,483	2/1965	Beitchman	260/2.5 AW
3,179,628	4/1965	Beitchman	260/2.5 AC
3,294,753	12/1966	Beitchman	260/77.5 NC
3,576,873	4/1971	Crounse	260/567.6 M
3,620,987	11/1971	McLaughlin	260/2.5 AC
3,624,082	11/1971	Lewis	260/567.6 M
3,636,114	1/1972	Tobler	260/567.6 M
3,654,261	4/1972	Johnson	260/567.6 M
3,726,816	4/1973	Fabris	252/431 C
3,746,709	7/1973	Patton	260/2.5 AC
3,804,782	4/1974	Demou	260/2.5 AW
3,806,475	4/1974	Narayan	260/2.5 AW

1. In the method of preparing cellular polyurethane plastic by the reaction of a precursor comprising a polyol having at least two alkanol groups per molecule, an organic polyisocyanate compound containing at least two isocyanate groups per molecule, a volatilizable blowing agent, and a catalyst, the improvement which comprises carrying out said reaction in the presence of a quaternary hydroxyalkyl tertiary amine base catalyst prepared by reacting substantially stoichiometric amounts of water or a carbinol selected from the group consisting of methanol, ethanol, benzyl alcohol, furfuryl alcohol, allyl alcohol, phenol, octylphenol, nonylphenol, methylphenol, methoxyphenol, ethoxyphenol, 3-diethylamino phenol, naphthol, resorcinol, 1,4-hydroquinone, chlorophenols, chloronathphols and p,p′-dihydroxydiphenyldimethylmethane; an alkylene oxide selected from the group consisting of propylene oxide, ethylene oxide, 1,2-butylene oxide, 1,2-pentene oxide, styrene oxide, butadiene epoxide, diepoxides prepared from p,p′-dihydroxydiphenyldimethylmethane and epichlorohydrin, an olefin oxide having 9–14 carbon atoms and mixtures thereof; and a tertiary amine selected from the group consisting of trimethylamine, triethylamine, tripropylamine, triisobutylamine and mixtures thereof.

2. The method of claim 1 wherein said catalyst also contains a tertiary amine.

B 497,473

PROCESS FOR OBTAINING IRREGULAR SHADOW DYEINGS ON POLYESTER FIBERS AND MIXTURES THEREOF

Hans-Ulrich von der Eltz, Frankfurt am Main, and Hans-Peter Maier, Sulzbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 14, 1974, Ser. No. 497,473

Claims priority, application Germany, Aug. 16, 1973, 2341428

Int. Cl.[2] D06P *3/54*, *3/87*, *3/86*

U.S. Cl. 8—14 6 Claims

References Cited

UNITED STATES PATENTS

713,837	11/1902	Barraclough et al.	8/15
763,196	6/1904	Miegel	8/14
1,615,205	1/1927	Muelberger	8/14
3,189,578	6/1965	Kuemmerer	260/77.5 AP
3,265,461	8/1966	Luetzel et al.	8/39
3,352,624	11/1967	Harding et al.	8/15
3,634,580	1/1972	Watase et al.	8/15
3,787,175	1/1974	Von der Eltz	8/14
3,787,176	1/1974	Von der Eltz	175/18

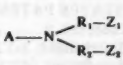
FOREIGN PATENTS OR APPLICATIONS

1,453,148	8/1966	France	8/34

OTHER PUBLICATIONS

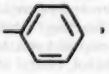
Redbook Magazine, June 1970, pp. 81, 172, 174 and 176 (Vol. 135, No. 2).

1. A process for obtaining irregular tone-in-tone effects, shadow effects or multi-color effects on polyester fibers and blends thereof with cellulose fibers by padding polyester fiber-containing warps with a sizing liquor which contains, in addition to a sizing agent, a disperse dyestuff of the formula



wherein A is a mono or disazo dyestuff radical, R_1 is a direct bond, $-CH_2-$ or $-C_2H_4-$, R_2 is $-CH_2-$ or $-C_2H_4-$, Z_1 is $-H$, $-OH$, $-CN$ or $-OOC-CH_3$, Z_2 is $-H$, $-CN$, $-OOC-CH_3$,

or



with subsequent drying and weaving these warps with weft yarn which is undyed or dyed in a different manner, without prior fixation, which process comprises binding the piece goods so obtained to a rope, loosely tying them and spraying them with an aqueous solution of an alkaline agent which is free from oxidizing or reducing agents, irregularly and unevenly from the outside, and thermosoling them after opening the rope to fix the dyestuff.

B 506,148

PROCESS FOR PRODUCING CAPROLACTAM FROM 6-MINOCAPROIC ACID

Frantisek Mares, Whippany, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,148

Int. Cl.[2] C07D *201/08*

U.S. Cl. 260—239.3 A 3 Claims

References Cited

FOREIGN PATENTS OR APPLICATIONS

30-6112	8/1955	Japan	260/239.3 A

1. In a process of converting 6-aminocaproic acid, dissolved in methanol or ethanol, to epsilon caprolactam the improvement comprising dissolving said acid in solvent containing at least 60 percent by volume of ethanol, methanol or a mixture thereof, under conditions such that no substantial reaction occurs prior to complete dissolution; and thereafter maintaining the resulting solution at temperature in the range of 170°-200°C.

B 506,648

AZINE DERIVATIVES OF PIPERIDINE

Brian Holt, Royton, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 181,568, Sept. 17, 1971, Pat. No. 3,853,890. This application Sept. 16, 1974, Ser. No. 506,648

Claims priority, application United Kingdom, Sept. 19, 1970, 44759/70

Int. Cl.[2] C08K *5/34*

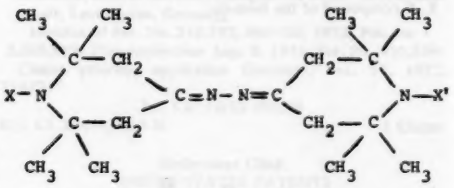
U.S. Cl. 260—45.8 N 5 Claims

References Cited

UNITED STATES PATENTS

2,181,121	11/1939	Downing et al.	260/45.9
2,684,965	7/1954	Weston et al.	260/293.87
3,407,174	10/1968	Kuriyama et al.	260/45.9
3,431,232	3/1969	Murayama et al.	260/45.8
3,474,068	10/1969	Murayama et al.	260/45.8
3,684,765	8/1972	Matsui et al.	260/45.8
3,705,126	12/1972	Matsui et al.	260/45.8
3,734,883	5/1973	Holt	260/45.8
3,853,890	12/1974	Holt	260/293.63

1. A composition comprising an oragnic material selected from the group consisting of polyolefins and polymers of acrylonitrile, butadiene and styrene, and a minor portion of a compound of the formula



wherein X and X' are the same or different and represent NO, formyl acetyl or propionyl.

B 510,850

METHOD OF USING FLUORENE-2-ACETIC ACID DERIVATIVES

Eric T. Stiller, Sarasota, Fla.; Seymour D. Levine, North Brunswick, N.J.; Pacifico A. Principe, South River, N.J., and Patrick A. Diassi, Westfield, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 298,102, Oct. 16, 1972, Pat. No. 3,856,977, which is a continuation-in-part of Ser. No. 70,913, Sept. 9, 1970, Pat. No. 3,859,340. This application Sept. 30, 1974, Ser. No. 510,850

Int. Cl.² A61K *27/00*

U.S. Cl. 424—317 4 Claims

References Cited

UNITED STATES PATENTS

3,709,994	1/1973	Bencze	424/317
3,819,693	6/1974	Levine et al.	260/520
3,859,340	1/1975	Stiller et al.	260/515 R
3,903,145	9/1975	Levine et al.	260/515 R

1. A method for treating inflammatory conditions in a mammalian host responsive to treatment with anti-inflammatory agents, which comprises administering to a mammalian host an effective amount of a compound selected from the group consisting of 7-halo-fluorene-2-acetic acid, 7-amino-fluorene-2-acetic acid, and 7-nitrofluorene-2-acetic acid.

B 516,296

ACYLTHIOMETHYL ESTERS OF CEPHALOSPORINS

Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 277,700, Aug. 3, 1972, Pat. No. 3,860,591. This application Oct. 21, 1974, Ser. No. 516,296

Int. Cl.² C07D *501/20*

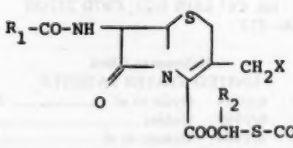
U.S. Cl. 260—243 C 6 Claims

References Cited

UNITED STATES PATENTS

3,847,913	11/1974	Gudtfredsen et al.	260/243 C
3,852,282	12/1974	Dolfini	260/243 C
3,855,213	12/1974	Dunn et al.	260/243 C
3,867,380	2/1975	Dunn et al.	260/243 C

1. A compound of the formula



wherein R_1 is α-aminobenzyl; R_2 is hydrogen or lower alkyl; R_3 is lower alkyl; and X is tetrazolylthio or (lower alkyl)-tetrazolylthio.

B 526,096

7-SUBSTITUTED CEPHALOSPORANIC ACID AND DERIVATIVES THEREOF

Joseph Edward Dolfini, Princeton, and Ekkehard Bohme, Hightstown, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 260,635, June 7, 1972, Pat. No. 3,867,379, which is a continuation-in-part of Ser. No. 119,034, Feb. 25, 1971, abandoned. This application Nov. 22, 1974, Ser. No. 526,096

Int. Cl.² C07D *501/20*

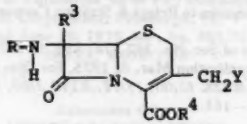
U.S. Cl. 260—243 C 11 Claims

References Cited

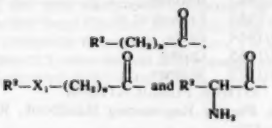
UNITED STATES PATENTS

3,843,641	10/1974	Christensen et al.	260/243 C

1. A compound of the formula:



wherein R^3 is lower alkyl; R^4 is selected from the group consisting of hydrogen, lower alkyl, trichloroethyl, benzyl, methoxybenzyl, and benzhydryl; Y is selected from the group consisting of hydrogen, acetoxy, pyridinium, and hydroxy; and R is selected from the group consisting of



wherein n is zero or one, X_1 is O or S, and R^2 is selected from the group consisting of thienyl, phenyl, isoxazolyl, and mono and disubstituted phenyl, thienyl, and isoxazolyl wherein said substituents are selected from the group consisting of chloro, bromo, nitro, lower alkyl, and lower alkoxy; and pharmaceutically acceptable salts thereof.

B 527,999

CORROSION INHIBITING COMPOSITIONS AND PROCESS FOR INHIBITING CORROSION OF METALS

Benjamin F. Ward, and William G. Vardell, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 341,588, March 15, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 527,999

Int. Cl.² C23F *9/02*, *11/00*, *11/10*

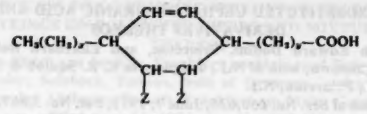
U.S. Cl. 21—2.7 R 2 Claims

References Cited

UNITED STATES PATENTS

2,632,695	3/1953	Landis et al.	44/66
3,763,053	10/1973	Bills	252/357

1. A process for rust inhibition of metallic surfaces contacted by petroleum hydrocarbons and aqueous media which comprises, contacting said metallic substances with from 1 to 200 parts per million of an additive of the group consisting of a dicarboxylic acid having the following structure:



wherein x and y are integers from 3 to 9, x and y together equal 12, and Z is a member of the group consisting of hydrogen and COOH with one Z of each moiety, the hydrogenated dicarboxylic acid of said structure, the bisalkanolamide derivatives of said dicarboxylic acid, the mono-alkanolamide derivatives of said dicarboxylic acid, and the mono-alkanolamide derivatives of a soap of said dicarboxylic acid.

B 555,437

METHOD OF PLUGGING ARMATURE SLOTS

John D. Santi, West Allis, and Edward A. Boyd, Sussex, both of Wis., assignors to Briggs & Stratton Corporation, Milwaukee, Wis.

Continuation of Ser. No. 387,174, Aug. 9, 1973, abandoned. This application Mar. 5, 1975, Ser. No. 555,437

Int. Cl.² H02K *15/06, 15/12;* **B29D** *3/00;* **B29F** *5/00*

U.S. Cl. 264—161 **6 Claims**

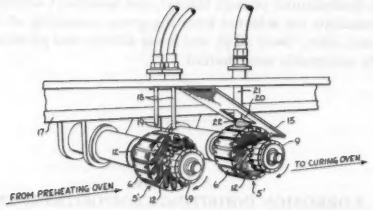
References Cited

UNITED STATES PATENTS

1,182,982	5/1916	Crump	118/409
1,416,987	5/1922	Sharpe	425/218
1,524,915	2/1925	DeBay	425/219
1,751,430	3/1930	Thomson	264/162
1,902,551	3/1933	Fredrickson	29/205 E
2,368,085	1/1945	Barbieri	264/162
3,071,496	1/1963	Fromm et al.	264/272
3,129,349	4/1964	Ervin	29/597
3,182,219	5/1965	Quinn	29/597
3,689,280	9/1972	Werner	425/220

OTHER PUBLICATIONS

Randolph et al, Plastics Engineering Handbook, Reinhold, (1960) pp. 217–222.



1. The method of plugging the mouths of axially extending, radially outwardly opening winding slots in a substantially cylindrical dynamoelectric machine rotor core to confine in said slots lengths of conductors which comprise the rotor windings of the machine and which are all disposed radially inwardly of opposite ledges that project towards one another across each slot to define a narrow mouth for it, said method being characterized by:

A. supporting the core for rotation about a fixed axis with its circumferential surface bearing against a substantially flat surface of a paddle at least along a zone of the core that is intermediate its ends;

B. depositing between said surface and the rotor core in said zone a quantity of a plastic insulating material that can be cured to substantial hardness and which material is sufficiently viscous to resist flow under the force of gravity;

C. effecting rotation of the rotor core about its axis relative to said paddle to wipingly force said material into the axially medial portions of the winding slots and under the ledges thereof so that the material thus forced beneath the ledges can form a mechanical interlock with the core; and

D. curing said material.

B 562,813

HOT STAMPING DIE CHASE

Harold W. King, 320 West 100th Terrace, Kansas City, Mo. 64114

Filed Mar. 28, 1975, Ser. No. 562,813

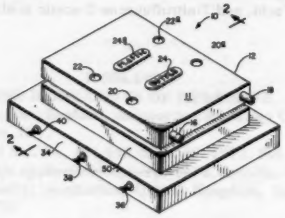
Int. Cl.² B29C *17/00*

U.S. Cl. 425—384 **10 Claims**

References Cited

UNITED STATES PATENTS

2,496,014	1/1950	Myers	425/384 X
2,849,752	9/1958	Leary	425/384 X
3,072,964	1/1963	Tilden	425/388
3,553,784	1/1971	Shuman	425/384 X
3,593,376	7/1971	Kisker et al.	425/384 X



1. A hot stamping die chase and die used for decorating hollow, plastic articles which comprises:

a. a heat transfer base;

b. a die carrying means and a die, said die carrying means carrying said die and being joined to said base; and

c. article support means having a face for supporting the surface of said article as it is brought into contact with said die, said article support means having at least one opening therethrough through which said die protrudes above said face.

B 566,464

N,N-DIMETHYL-O-(1-METHYL-3-N-METHYLCARBAMINYL-METHYL-PYRAZOL(5)YL)-CARBAMIC ACID ESTER

Hellmut Hoffmann, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 9, 1975, Ser. No. 566,464

Claims priority, application Germany, Apr. 26, 1974, 2420360

Int. Cl.² A01N *9/22;* **C07D** *231/20*

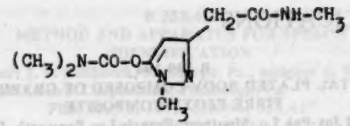
U.S. Cl. 424—273 **3 Claims**

References Cited

UNITED STATES PATENTS

2,681,915	6/1954	Gysin et al.	260/310 R
3,449,502	6/1969	Gubler	424/273
3,452,043	6/1969	Grauer et al.	424/273
3,810,911	5/1974	Hoffman et al.	424/273

1. N,N-Dimethyl-O-[1-methyl-3-N-methylcarbaminylmethyl-pyrazol(5)yl]-carbamic acid ester of the formula



B 576,903

INSECTICIDAL AND MITICIDAL METHOD CONTAINING PHOSPHORUS COMPOUNDS

Arnold G. Gutman, Berkley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 353,868, April 23, 1973, abandoned, which is a division of Ser. No. 123,410, March 11, 1971, Pat. No. 3,780,143. This application May 12, 1975, Ser. No. 576,903

Int. Cl.[2] A01N 9/36

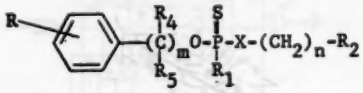
U.S. Cl. 424—203 6 Claims

References Cited

UNITED STATES PATENTS

3,060,087	10/1962	Kingsbury et al.	424/203
3,094,406	6/1963	Price et al.	424/203

1. The method of controlling insects and mites comprising applying to the habitat infested with mites and insects an effective insecticidal and miticidal amount of a compound corresponding to the formula



wherein R is methylenedioxy; R_1 is ethyl; X is sulfur; *n* and *m* are one; R_2 is selected from hydrogen, methylthio, cyano, benzylthio, and ethynyl; and, R_4 and R_5 are hydrogen.

B 585,731

COMPOSITION FOR VO_2 INCANDESCENT LAMP CURRENT INRUSH LIMITERS

Philip J. Nalepa, Greensburg; Peter R. Emtage, and Robert C. Miller, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1975, Ser. No. 585,731

Int. Cl.[2] H01B 1/08

U.S. Cl. 252—518 2 Claims

References Cited

UNITED STATES PATENTS

3,402,131	9/1968	Futaki et al.	252/518 X
3,557,026	1/1971	Teeg et al.	252/518

OTHER PUBLICATIONS

Japanese Journal of Applied Physics, Vol. 8, No. 8, Aug. 1969.

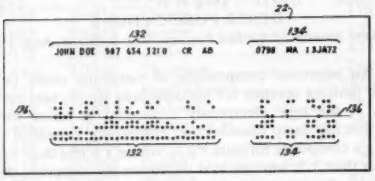
1. An improved composition of vanadium oxide current inrush limiting ceramic for incandescent lamps, said ceramic being of the type electrically connected in series with an incandescible lamp filament and comprising vanadium oxide having a composite formula V_xO_x, where *x* is less than 4.5 and greater than 3.5; wherein said improvement comprises doping said ceramic with 0.003–0.06 weight percent of MoO_3.

ELECTRICAL APPLICATIONS

B 283,941
DATA ACCUMULATION SYSTEM
Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 284,071, Aug. 28, 1972. This application Aug. 28, 1972, Ser. No. 283,941
Int. Cl.[3] G11B *5/86*
U.S. Cl. 360—15 **6 Claims**

References Cited
UNITED STATES PATENTS

3,037,090	5/1962	Bouzemburg	179/100.2 E
3,341,854	9/1967	Supernowicz	179/100.2 E
3,401,394	9/1968	Leonard et al.	346/74
3,496,304	2/1970	Nelson	179/100.2 E
3,571,527	3/1971	Becker et al.	179/100.2 E
3,617,648	11/1971	Irving	179/100.2 E



1. A method of accumulating data for processing in electronic data processing equipment, wherein a master source document is magnetized in a discrete pattern to provide external magnetic fields representative of data related to said document, a recording medium susceptible to said external magnetic fields is momentarily positioned adjacent the master source document to magnetically record said pattern onto the recording medium and said pattern is subsequently sensed from the recording medium to produce an electrical signal representative of said data for electronic data processing, characterized by the steps of

providing as said master source document a homogeneous sheet of particulate permanet magnet material in a flexible binder for enabling said magnetization in a discrete pattern throughout the sheet, said sheet having a coercive force of not less than 1000 oersteds and a maximum energy product of not less than 5×10^5 gauss-oersteds for enabling said document to provide external magnetic fields which can be sufficiently intense to allow the magnetic recording of said patterns onto the recording medium even though the master source document and the recording medium are not in intimate contact,

providing a magnetic recording tape as the recording medium,

supporting the tape in a transport path,

sequentially advancing successive lengths of the tape along the path, and

positioning a said length of the tape adjacent a said master source document when the tape is stationary within said path.

B 339,194
METAL PLATED BODY COMPOSED OF GRAPHITE FIBRE EPOXY COMPOSITE
Gerald Joy-Pak Lo, Montreal; Francis Leo Papworth, Dollard des Ormeaux; Nicolas Elmars Tenne-Sens, Lachine; Michael Valentine O'Donovan, Dorval, and Gerald Dziub, St. Laurent, all of Canada, assignors to RCA Corporation, New York, N.Y.
Filed Mar. 8, 1973, Ser. No. 339,194
Int. Cl.[2] H01P *1/20, 3/12, 11/00*
U.S. Cl. 333—73 W **1 Claim**

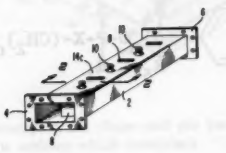
References Cited
UNITED STATES PATENTS

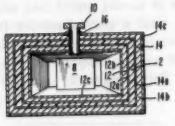
3,607,350	9/1971	Rathsack	204/30 X
3,716,869	2/1973	Gould, Jr. et al.	333/95 X
3,808,028	4/1974	Lando	117/213 X

OTHER PUBLICATIONS

Harvey–"Microwave Engineering" Academic Press, London and New York 1963; pp. 219–220 & 717.

"Microwave Transmission Design Data" Sperry Gyroscope Co. Brooklyn N.Y. pp. 88–89.





1. A hollow microwave waveguide filter having good inner surface electrical conductivity comprising

a tubular shaped body composed of graphite fibre epoxy composite,

said body having its inner surface slightly roughened,

a thin flash coating of hardened nickel on said inner surface,

a thicker coating of copper on said nickel coating,

a coating of silver over said copper coating,

a thin flash outer coating of hardened nickel on the outer surface of said body,

a thicker outer coating of copper on said outer nickel coating

solder areas on said outer copper coating, said solder having a melting point of up to about 150°C., and

a coating of silver over said solder areas and outer copper coating.

B 358,427

METHOD AND APPARATUS FOR SPEECH IDENTIFICATION

Heribert J. P. Reitboeck, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

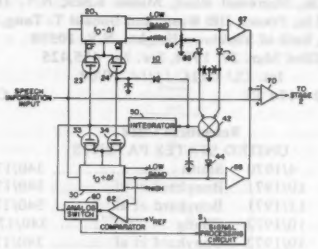
Filed May 8, 1973, Ser. No. 358,427
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SB 12 Claims

References Cited
UNITED STATES PATENTS

2,575,910	11/1951	Mathes	179/1 SB
2,819,341	1/1958	Barney	179/1 SA
2,857,465	10/1958	Schroeder	179/1 SA
3,423,530	1/1969	Coulter	179/1 SA
3,437,757	4/1969	Coker	179/1 SA
3,509,280	4/1970	Jones	179/1 SB
3,700,815	10/1972	Doddington	179/1 SA
3,787,774	1/1974	Tietze	328/167

FOREIGN PATENTS OR APPLICATIONS

2,019,280	11/1970	Germany	179/1 SA



1. Apparatus for tracking a spectral peak within the frequency spectrum of a spoken word wherein a spectral peak is a frequency which corresponds to a peak amplitude in the spoken word, comprising:

first and second electronically tunable filter means connected to receive spoken words and produce an output signal having an adjustable center frequency and an adjustable Q characteristic, said first tunable filter means responding to the frequency content of spoken words occurring in a frequency range in a first direction from said center frequency and a second tunable filter means responding to the frequency content of spoken words occurring in the frequency range in an opposite direction, said first and second tunable filter means including control inputs to receive control input signals to adjust said center frequencies and said Q characteristics, and

feedback control means connected to the outputs of said first and second tunable filter means to determine the deviation of said center frequencies from a spectral peak in said spoken word and develop a control input signal to adjust said center frequencies to establish a predetermined relationship between said center frequencies and spectral peak.

B 403,477

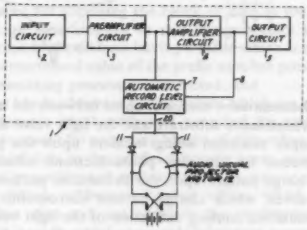
AUDIO CIRCUIT WITH NOISE MUTING FEATURE

Charles William Miller, Village of Inver Grove Heights, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Oct. 4, 1973, Ser. No. 403,477
Int. Cl.² G03B *31/00*
U.S. Cl. 360—80 5 Claims

References Cited
UNITED STATES PATENTS

2,633,055	3/1953	Badmaieff	360/3
3,334,194	4/1967	Chang	360/69
3,591,730	6/1971	Chang	360/61
3,673,345	6/1972	Ban	360/74
3,705,272	12/1972	Tsuji et al.	360/62
3,712,961	1/1973	Nye et al.	179/100.1 DR
3,721,774	3/1973	Yonemoto et al.	360/61



1. An audio circuit for use with a device having an electrically actuated noise generating source that produces electrical noise during intervals when no desired audio signal is being processed, which audio circuit contains a transistor stage connected between an amplifier portion of the audio circuit and an electrical ground, wherein the improvement comprises:

muting circuitry for connecting the transistor stage to the electrical power actuating said noise generating source so that when said noise source is electrically actuated an electrical signal is also provided to said transistor stage during and only during the application of electrical power to said noise generating source, which electrical signal is provided only during the generation of noise by said noise source to switch the transistor stage and shunt the amplifier to ground through said transistor stage, thereby muting said electrical noise in the audio circuit.

B 442,970

OPTICAL IMAGING SYSTEM UTILIZING A LIGHT VALVE ARRAY AND A COUPLED PHOTOEMISSIVE TARGET

Harvey C. Nathanson, Pittsburgh, Pa.; Jens Guldberg, Hamburg, Germany, and Daniel R. Muss, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 14, 1974, Ser. No. 442,970
Int. Cl.² H04N *3/16*
U.S. Cl. 178—7.3 D 7 Claims

References Cited
UNITED STATES PATENTS

2,740,830	4/1956	Gretener	358/62
3,592,529	7/1971	Juhlin et al.	358/62
3,746,911	7/1973	Nathanson et al.	178/7.5 D

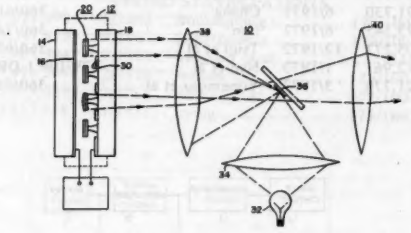
1. An optical imaging system comprising an evacuated hermetically sealed system comprising:

an input-radiation-transmissive substrate;

a imaging-radiation-transmissive substrate spaced from the input-radiation-transmissive substrate;

an array of electrostatically deflectable, reflective light valves supported upon the imaging substrate, which light valves each comprise a support post extending from the imaging substrate with a generally planar deflectable and reflective portion disposed at the extending end of the central support post;

an electrode grid disposed upon the imaging substrate between the spaced apart light valves;



a photoemissive means coupled between the input radiation transmissive substrate and the light valve array, with the input radiation being incident upon the photoemissive means to generate photoelectrons which produce a charge pattern upon the deflectable portions of the light valves, which charge pattern corresponds to the input radiation causing deflection of the light valve; and

output radiation imaging means for directing output radiation onto the light valve array through the imaging substrate, with the output radiation being reflected from the deflected light valves and passed through the imaging radiation transmissive substrate as a function of the input radiation.

B 454,283

OPTICAL PROJECTORS

Pierre Malifaud, Paris, France, assignor to Ste de Recherche et de Promotion d'Activities Nouvelles ACNO, Paris, France

Filed Mar. 25, 1974, Ser. No. 454,283

Claims priority, application France, Mar. 4, 1973, 73.11871; Mar. 4, 1973, 73.11872

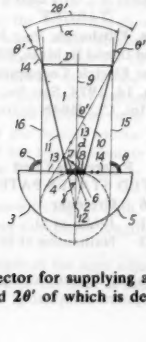
Int. Cl.[2] F21V *7/00*

U.S. Cl. 240—41.35 R **7 Claims**

References Cited

UNITED STATES PATENTS

3,318,184	5/1967	Jackson	352/198 X
3,676,667	7/1972	Malifaud	240/41.35 R
3,711,701	1/1973	Squyres	240/41.35 R



1. An optical projector for supplying a beam of radiation, the total angular field $2\theta'$ of which is determined in at least one reference plane, the angular field containing all the radiant flux, comprising:

a. a source of radiation;

b. an optical collector system for receiving and reflecting radiation from said source; and

c. a conoid mirror having a minor base and a major base in which said minor base in conjunction with said optical collector system entirely contain optically said source of radiation, said mirror having at least said reference plane as a plane of symmetry, and wherein said mirror has dimensional relationships which apply to a cross-section through the plane of symmetry in conformity with the equation

$$\frac{D}{d} \cong \frac{\sin(\theta - \gamma)}{\sin(\theta' - \gamma)}$$

where D and d are, respectively, the cross-sectional lengths of said major and minor bases of said mirror in said cross-sectional plane, γ is half the mean apex angle of said mirror in said cross-sectional plane, and θ is half a maximum predetermined angle of the angular extension of radiant beams received at said minor base of said mirror.

B 455,425

CRYPTOGRAPHIC MAGNETIC BUBBLE DOMAIN MEMORY

Yeong S. Lin, Stanwood Road, Mount Kisco, N.Y. 10549; Chao N. Liu, French Hill Road, and Donald T. Tang, 2491 Ridge St., both of Yorktown Heights, N.Y. 10598

Filed Mar. 27, 1974, Ser. No. 455,425

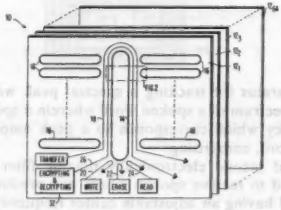
Int. Cl.[2] G11C *11/14, 19/08*

U.S. Cl. 340—174 TF **14 Claims**

References Cited

UNITED STATES PATENTS

3,508,225	4/1970	Smith	340/174 TF
3,613,058	10/1971	Bonyhard et al.	340/174 TF
3,618,054	11/1971	Bonyhard et al.	340/174 TF
3,701,125	10/1972	Chang	340/174 AC
3,701,132	10/1972	Bonyhard et al.	340/174 TF
3,737,882	6/1973	Furuoya	340/174 TF



1. In a magnetic bubble domain memory including a plurality of data storage levels, means for entering plural bit data words into the memory in bit synchronism, with each word bit being represented by the presence or absence of a magnetic bubble domain, and means for moving the magnetic bubble domains within the data storage levels in cyclic steps along predetermined propagation paths, the improvement comprising means for encrypting the entered data words, comprising:

means for inhibiting the shifting of the magnetic bubble domains in a nondestructive manner and in cyclic steps in selected storage levels for a predetermined number of cyclic steps, such that the bits in each word are skewed or permuted to thereby destroy the bit synchronism in

each word yet maintaining the bit synchronism in each storage level.

B 461,336

PREFIXING IN A MULTIPROCESSING SYSTEM

William A. Bernstein, Kingston, and Robert H. Doggett, Ulster Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 239,894, March 31, 1972. This application Apr. 16, 1974, Ser. No. 461,336

Int. Cl.[2] G06F *1/00*

U.S. Cl. 340—172.5 **4 Claims**

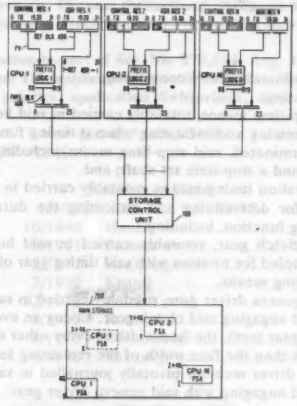
References Cited

UNITED STATES PATENTS

3,505,647	4/1970	Torfeh et al.	340/172.5
3,510,847	5/1970	Carlson et al.	445/1
3,551,892	12/1970	Driscoll, Jr.	445/1

OTHER PUBLICATIONS

An application–oriented multiprocessing system—IBM 9020 System, Blakeney et al.; IBM Systems Journal, Vol. 6, No. 2, 1967, pp. 80–94, Armonk, N.Y.



1. In a shared storage multiprocessing system that includes a plurality of processors and an addressable storage arranged into blocks of storage for storing blocks of data, a method by which each of said processors may access all of said blocks of data comprising the steps of:

providing a prefix number for one of said processors having a zero value which is equal to the block address of a prefixed storage area consisting of a block of storage assigned to said one processor,

providing reference block addresses for said one processor,

detecting the zero value of said prefix number and the values of said reference block addresses provided for said one processor,

providing storage block addresses for said one processor for accessing all of said blocks of data in accordance with the detected values including:

a storage block address having a value which is equal to the zero value of the prefix number provided for said one processor for accessing the block of data in the prefixed storage area assigned to said one processor when the reference block address having a value which is equal to zero is detected, and

other storage block addresses having values which are equal to the reference block addresses provided for said one processor for accessing blocks of data other than the block of data contained in the prefixed storage area assigned to said one processor when reference block addresses having values which are greater than zero are detected,

providing prefix numbers for the remaining processors having different predetermined values which are greater than zero and equal to the block addresses of different prefixed storage areas consisting of blocks of storage assigned to said remaining processors,

providing reference block addresses for each of said remaining processors,

detecting the predetermined value of the prefix number and the values of the reference block addresses provided for each of said remaining processors, and

providing storage block addresses for each of said remaining processors for accessing all of said blocks of data in accordance with the detected values including:

a first storage block address having a value which is equal to the predetermined value of the prefix number provided for said remaining processor for accessing the block of data in the prefixed storage area assigned to said remaining processor when the reference block address having a value which is equal to zero is detected,

a second storage block address having a value which is equal to zero for accessing the block of data in the prefixed storage area assigned to said one processor when the reference block address having a value which is equal to the predetermined value of the prefix number provided for said remaining processor is detected, and

other storage block addresses having values which are equal to the reference block addresses provided for said remaining processor for accessing blocks of data other than the blocks of data in the prefixed storage areas assigned to said one processor and said remaining processor when reference block addresses having values which are greater than zero and not equal to the predetermined value of the prefix number provided for said remaining processor are detected.

B 475,236

FEEDBACK FIELD CONTROL FOR AN ELECTRIC VEHICLE

Francis T. Thompson, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 31, 1974, Ser. No. 475,236

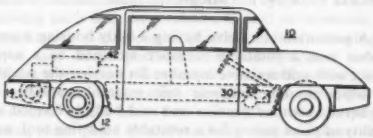
Int. Cl.[2] H02P *5/06*

U.S. Cl. 318—139 **15 Claims**

References Cited

UNITED STATES PATENTS

3,546,548	4/1968	Wouk	318/139
3,569,809	3/1971	Comer	318/338
3,599,064	8/1971	Friedman	318/338
3,735,220	5/1973	Renner et al.	318/493 X
3,745,434	7/1973	Lambert	318/139
3,845,368	10/1974	Elco	318/139
3,855,511	12/1974	Smith	318/317



1. An electric vehicle comprising:

a direct current drive motor;

a separately excited field winding disposed within said direct current drive motor;

throttle means for controlling the speed of said direct current drive motor;

armature current feedback means connected to said direct current drive motor to provide a feedback signal proportional to the armature current flowing through said direct current drive motor;

armature current reference means connected to said throttle providing an armature demand reference signal dependent on the position of said throttle;

error amplifier means connected to said armature current feedback means and said armature current reference means for comparing the armature feedback signal and the armature demand reference signal and providing a field demand signal depend on the difference between the feedback signal and the reference signal;

field current output amplifier means connected to said error amplifier and said separately excited field winding providing current flow through said separately excited field winding in response to the error signal received from said error amplifier means;

armature demand reference signal reducing means connected to said armature current to said armature current reference means for providing a modified armature demand reference signal when activated;

speed detector means connected to detect the speed of said direct current drive motor and to provide a signal proportional to the direct current drive motor speed; and,

said speed detector means being connected to said armature demand reference signal reducing means for reducing the armature demand reference signal when the speed of said direct current drive motor exceeds a predetermined value.

B 489,526

TRIMMING POTENTIOMETER WITH COARSE AND FINE ADJUSTMENT MEANS

Derek Taylor, Whitstable, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 18, 1974, Ser. No. 489,526

Claims priority, application United Kingdom, Aug. 1, 1973, 36624/73

Int. Cl.² H01C *10/32*

U.S. Cl. 338—166 **7 Claims**

References Cited

UNITED STATES PATENTS

1,450,566	4/1923	Smith	317/255 X
1,501,454	7/1924	Hunt	74/10.54 X
1,575,153	3/1926	Dobbins	317/255 X
1,805,154	5/1931	Webster	74/10.54
3,187,287	6/1965	Weidenman	338/163
3,235,827	2/1966	Baker	338/162
3,360,757	12/1967	Wahlberg	338/162
3,576,512	4/1971	Michik	338/174

1. A potentiometer drive having a body housing a resistive member and a rotatable member attached to a wiper in contact with said resistive member for varying the position of said wiper thereon, wherein said rotatable member has a peripherally toothed portion and said body is formed with a piurality of pivot points for a rotatable adjusting tool, each of said pivot points being spaced from said peripherally toothed portion of said rotatable member by less than the radius of said rotatable member, whereby a toothed adjusting tool can be engaged with any one of said pivot points and with the toothed portion of said rotatable member for adjustment of said rotatable member by rotation of the tool, said pivot points being pegs formed on said body for rotatably fitting within a bore in the nose of an adjusting tool, and being positioned to define different adjustment directions for the tool.

B 494,383

AUTOMATIC TIMER

Richard H. Weber, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Aug. 5, 1974, Ser. No. 494,383

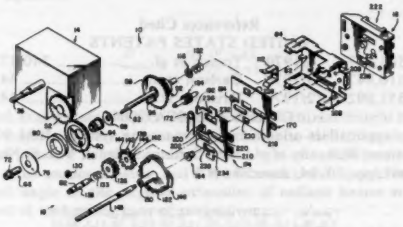
Int. Cl.² H01H *7/08, 43/10*

U.S. Cl. 200—38 FA **3 Claims**

References Cited

UNITED STATES PATENTS

3,694,591	9/1972	Bassett et al.	200/38 FA



1. An automatic timer comprising:

a. a housing;

b. a stop-time means, rotatably carried in said housing, for determining and indicating when a timing function is to be terminated, said stop-time means including a timing gear and a stop-time set shaft; and

c. a duration timing means, rotatably carried in said housing, for determining and indicating the duration of a timing function, including;

i. a clutch gear, rotatably carried in said housing and coupled for rotation with said timing gear of said stop-timing means,

ii. a geneva driver gear, rotatably carried in said housing and engaging said clutch gear, having an even number of gear teeth, the face width of every other tooth being less than the face width of the remaining teeth, and

iii. a driver member pivotally journalled in said housing and engaging with said geneva driver gear.

B 495,759

WIDE RANGE PULSE GENERATOR

Anthony G. Chaprnka, Cockeysville, and Patrick J. McKenzie, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,759

Int. Cl.² H02M *5/00*

U.S. Cl. 321—61 **10 Claims**

References Cited

UNITED STATES PATENTS

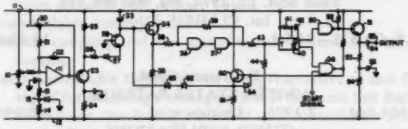
3,290,581	12/1966	Hooper	321/45 R
3,316,476	4/1967	Olson et al.	321/45 R
3,319,147	5/1967	Mapham	321/45 R X
3,465,231	9/1969	Hyde	321/45 R X
3,543,130	11/1970	Rennders	321/18 X
3,788,228	1/1974	Wilson	320/1 X

1. A pulse generator comprising:

an exponential voltage to current converter means adapted to respond to a DC input voltage level by producing an output current which is an exponential function of said DC input voltage level;

a first circuit means operatively connected to said exponential voltage to current converter means and responding to said output current by changing the charge state of a capacitor in a first direction;

second circuit means operatively connected to said first circuit means for generating an output pulse in response to a predetermined level of charge of said capacitor, and



third circuit means for changing the charge state of said capacitor in a second direction in response to said pulse.

B 496,500

METHOD OF INFORMATION TRANSMISSION WITH PRIORITY SCHEME IN A TIME-DIVISION MULTIPLEX COMMUNICATION SYSTEM COMPRISING A LOOP LINE

Ivor Jones, Winchester, England; Hans R. Mueller, Langnau, Switzerland; Daniel Wild, Kilchberg, Switzerland, and Pitro A. Zafiropulo, Horgen, Switzerland, assignors to International Business Machines Corporation, Yorktown Heights, N.Y.

Continuation-in-part of Ser. No. 279,595, Aug. 10, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,500

Claims priority, application Switzerland, Aug. 13, 1971, 11976/71

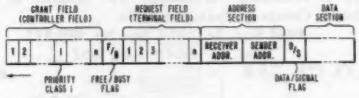
Int. Cl.² H04J *3/08*

U.S. Cl. 179—15 AL **6 Claims**

References Cited

UNITED STATES PATENTS

3,408,632	10/1968	Hauck	340/172.5
3,597,549	8/1971	Farmer et al.	179/15 AL
3,639,904	2/1972	Arulpragasam	179/15 AL
3,680,056	7/1972	Kropfl	179/15 AL
3,706,974	12/1972	Patrick et al.	340/172.5
3,732,543	5/1973	Rocher	179/15 AL
3,755,786	8/1973	Dixon et al.	179/15 AL
3,764,981	10/1973	Takasugi	179/15 AL



1. A method of information transmission with a priority scheme in a time-division multiplex communication system comprising a loop to which a plurality of terminals of different priority classes and at least one supervisory unit are attached, said method comprising the steps of:

transferring information on said loop by cyclically consecutive frames, each frame including a group of control characters;

said control characters comprising at least two fields for priority assignment, one of the fields serving as request field for the insertion of channel requests by attached terminals, discernable by priority class, and one other field serving as a grant field for characterizing which priority class may occupy the transmission channel represented by the corresponding frame;

formulating the contents of the grant field at said supervisory unit from the contents of a request field previously transmitted over the loop; and

determining at each terminal, if that terminal has requested channel allocation during the preceding cycle and if the grant field of the frame in the current cycle does not contain an identification of a class with higher priority than that of the respective terminal, or if the grant field of the frame in the current cycle does not contain any priority class identification and if so, seizing the frame of the current cycle for information transmission.

B 500,176

VIDEO RECORDING AND/OR REPRODUCING APPARATUS, AND RECORD ASSEMBLY FOR USE THEREIN

Nobutoshi Kihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 500,176

Claims priority, application Japan, Sept. 8, 1973, 48-101790

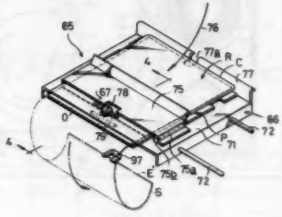
Int. Cl.² G11B *5/52, 5/80, 25/04*

U.S. Cl. 360—81 **58 Claims**

References Cited

UNITED STATES PATENTS

2,915,596	12/1959	Lyon et al.	360/84
3,534,182	10/1970	Prochrow	360/84
3,668,310	6/1972	Yano et al.	360/84
3,836,731	9/1974	Wilisch et al.	360/86



1. An apparatus for recording and/or reproducing at least video signal information comprising: a record assembly including cover means and at least one flexible sheet adapted to have at least video signal information recorded thereon and being movable in respect to said cover means between a stored position, in which said sheet is substantially enveloped and protected by said cover means, and an operative position in which a major portion of said sheet is withdrawn from said cover means and a minor portion of said sheet remains within said cover means; sheet driving means operative selectively for moving each said sheet relative to said cover means from said position to said operative position and for returning said sheet to said stored position from said operative position; rotary signal transducer means movable in at least one circular path about an axis substantially at right angles to the direction of movement of said sheet between said stored and operative positions; sheet guide means receiving each said sheet during the movement of the latter to said operative position and guiding said major portion of the sheet in an arcuate path substantially coinciding with at least a portion of said circular path of travel of said rotary signal transducer means; and translating means for moving said record assembly and said rotary signal transducer means relative to each other in directions parallel to said axis of rotation of the rotary signal transducer means to that the latter scan successive parallel record tracks on said major portion of said sheet in said arcuate path.

B 501,253
OVERLOAD PROTECTION CIRCUIT FOR TAPE RECORDING AND/OR REPRODUCING APPARATUS

Masao Tomioka, Kawaguchi, and Yasunori Orihara, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1974, Ser. No. 501,253

Claims priority, application Japan, Aug. 30, 1973, 48-101819[U]

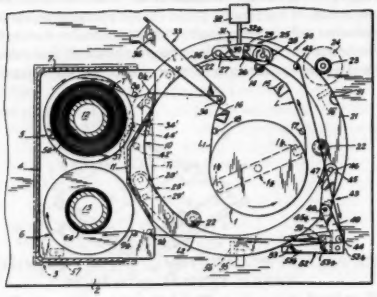
Int. Cl.² G11B *15/24, 15/66, 23/04*

U.S. Cl. 360—85 **12 Claims**

References Cited

UNITED STATES PATENTS

3,692,940	9/1972	Konno et al.	179/6 R
3,702,383	11/1972	Iraga et al.	360/85
3,711,649	1/1973	Ando	179/6 R
3,769,470	10/1973	Curtis	360/95
3,783,200	1/1974	Jantzen et al.	360/85



1. Tape recording and/or reproducing apparatus comprising:

a rotary head drum assembly comprising a rotary magnetic head and a tape guide drum;

means to support a supply of tape adjacent said assembly;

tape guide means movable in one direction from an initial position to a final position for withdrawing a loop of said tape from said supply and wrapping said loop on the periphery of said drum, and in the opposite direction from said final position to said initial position for unwrapping said loop and returning it to said supply;

electrically energized drive means selectively operable to move said tape guide means in said one direction and in said opposite direction;

timing means to measure predetermined intervals of time slightly longer than the normal lengths of time required to move said tape guide means

in said one direction from said initial position to said final position and in the opposite direction from said final position to said initial position, respectively; and

means responsive to said timing means to halt the electrical energizing of said drive means during operation of the latter for moving said tape guide means in said one direction and in said opposite direction at the ends of said respective predetermined intervals of time.

B 506,916
2,4,6 TRISUBSTITUTED PYRIDINE DYE LASERS

Channabasappa S. Angadiyavar, 6 Customs Quarters, College Road, Bombay, India, and Rangaswamy Srinivasan, Cedar lane, Ossining, N.Y. 10562

Filed Sept. 17, 1974, Ser. No. 506,916

Int. Cl.² H01S *3/00*

U.S. Cl. 331—94.5 L **19 Claims**

References Cited

UNITED STATES PATENTS

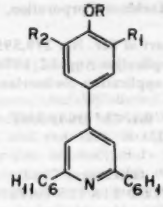
3,864,644	2/1975	Lincoln et al.	260/296 P

OTHER PUBLICATIONS

Snavely, Electro-Optical Systems Design, pp. 30–36 (Apr. 1973).

Barrio et al., J. Am. Chem. Soc. Vol. 95, pp. 4891–4895 (July 25, 1973).

1. A dye laser comprising an acidic laser dye solution and a pumping energy source operably coupled therewith and capable of producing stimulated emission of the dye solution, said dye solution comprising a lasing concentration in a non-interfering solvent, of a dye having the general structure as follows:



wherein R can be any alkyl group having from 1 to 6 C atoms; R_1 can be H, CH_3, C_2H_5, F, and OCH_3; R_2 can be H, CH_3, C_2H_5, F, or OCH_3; and R_1 can equal R_2.

B 508,817
LINE SELECTION CIRCUIT FOR A TELEVISION RECEIVER

Harry T. Freestone, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Sept. 24, 1974, Ser. No. 508,817

Int. Cl.² H04N *5/44, 9/62*

U.S. Cl. 178—7.5 R **6 Claims**

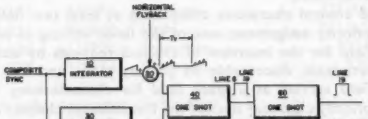
References Cited

UNITED STATES PATENTS

2,615,979	10/1952	Abbenhouse	178/7.5 S
3,423,525	1/1969	Baun	178/7.3 R
3,502,804	3/1970	Barr	178/7.5 R X
3,780,218	12/1973	Rennick	358/28

OTHER PUBLICATIONS

Type 529 Waveform Monitor Instruction Manual, Tektronix, Inc. 1965.



1. A line selection circuit for a television receiver for identifying a predetermined line in the even and odd fields of a frame of a received television signal comprising:

means for extracting a vertical sync pulse from both fields of the television signal,
means for deriving line rate pulses,
means for combining said line rate pulses with the vertical sync pulses to derive a first signal of repetitive alternating even and odd field trigger pulses,
controllable timing means,
means coupling said first signal to said controllable timing means,
said controllable timing means being responsive to said first signal for initiating a timing period at the same line during both fields, the timing period of said controllable timing means being designed to terminate within said predetermined line, and
means for applying line rate pulses to said controllable timing means to effect a precise termination of the timing period corresponding to the beginning of said predetermined line and providing an output signal indicative of the beginning of said predetermined line.

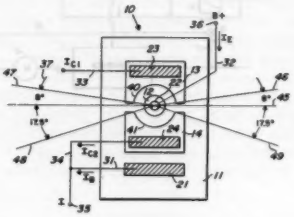
B 508,961
BETA COMPENSATED INTEGRATED CURRENT MIRROR

Kenneth J. Krolik, San Jose, Calif., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 25, 1974, Ser. No. 508,961
Int. Cl.² H01L *29/06, 29/72*
U.S. Cl. 357—36 **1 Claim**

References Cited
UNITED STATES PATENTS

3,579,059	5/1971	Widlar	357/35
3,633,052	1/1972	Hanna	357/35
3,694,762	9/1972	Mulder	307/299 B
3,700,921	10/1972	Gay	307/299 B
3,761,787	9/1973	Davis et al.	357/35
3,809,929	5/1974	Vittoz	357/36
3,820,007	6/1974	Schilling et al.	357/35
3,822,387	7/1974	Mulder	357/36
3,879,745	4/1975	Tharmaratnam	357/35



1. A lateral PNP type transistor having a beta of approximately 15 forming a beta compensated integrated current mirror comprising:
a. a base composed of semiconductor material;
b. an emitter formed on said base and in connection therewith;
c. first and second collector portions formed on said base in spaced relation from said emitter and each other and in partially encircling relationship to said emitter, said first and second collector portions each defining an inner edge adjacent said emitter with the inner edge of said first collector portion encircling approximately 163° of the emitter and the inner edge of said second collector portion encircling approximately 145° of the emitter, the amount of current from said emitter flowing in each of said collector portions being dependent upon the amount of said emitter encircled by the inner edges of each of said collector portions;
d. said base and said second collector portion being electrically connected so that the current flowing in said base and in said second collector portion forms a single current; and
e. the amount of said emitter encircled by each of the inner edges of said first and second collector portions being formed so that the current flowing in said first collector portion is approximately equal to the single current.

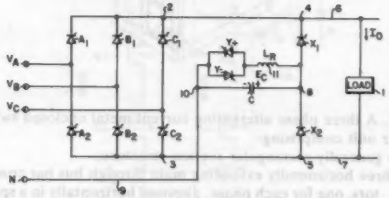
B 509,185
FORCE COMMUTATION STATIC FREQUENCY CHANGER APPARATUS USING DIRECT CAPACITOR COMMUTATION

Eric J. Stacey, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1974, Ser. No. 509,185
Int. Cl.² H02M *5/45*
U.S. Cl. 321—7 **23 Claims**

References Cited
UNITED STATES PATENTS

3,337,788	8/1967	Pelly	321/65
3,431,483	3/1969	Lafuze	321/7
3,470,447	9/1969	Gyugyi et al.	321/7
3,493,838	2/1970	Gyugyi et al.	321/7
3,742,336	6/1973	Bedford	321/7
3,763,418	10/1973	Beck et al.	321/45 C
3,842,341	10/1974	Goldberg	321/45 C



2. A force commutation static frequency changer for supplying with alternating current a load from a polyphase alternating current source via cyclically and temporarily conductive main controllable rectifiers associated in pairs with the respective phases of the alternating current source comprising:
capacitor means in series combination with auxiliary controllable rectifier means for applying a predetermined voltage in the reverse direction with respect to any of said main controllable rectifiers and for establishing a temporary path for said load current in derivation with respect to a conductive one of said main controllable rectifiers, said predetermined voltage being larger than the line to neutral voltage applied to said conductive main controllable rectifier thereby to turn it OFF after said temporary path has been established at the magnitude of said load current, said series combination being connected in parallel with said main controllable rectifiers and in series with said load and said alternating current source.

B 509,606

METAL ENCLOSED SWITCHGEAR HAVING WELL-SHAPED FRONT COVERS

James R. Farley, Pittsburgh; John G. Salvati, and Louis N. Ricci, both of Beaver Falls, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 346,551, March 30, 1973. This application Sept. 26, 1974, Ser. No. 509,606

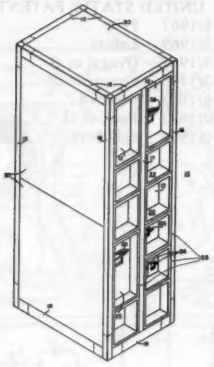
Int. Cl.² H02B 1/10

U.S. Cl. 317—120 **21 Claims**

References Cited

UNITED STATES PATENTS

2,786,162	3/1957	Ballou	317/119
2,978,613	4/1961	Hein	317/119
3,321,672	5/1967	Kuhn et al.	317/120
3,348,103	10/1967	Berry	317/120
3,743,892	7/1973	Fritz et al.	317/120
3,780,355	12/1973	Salvati et al.	317/120



1. A three phase alternating current metal enclosed switchgear unit comprising:

a generally rectangular section structure;

three horizontally extending main through bus bar conductors, one for each phase, disposed horizontally in a spaced apart relationship in said rectangular section;

three vertical riser conductors disposed in said rectangular section in front of said main horizontal through bus conductors;

connector means electrically connecting each phase of said horizontal main through bus to its associated vertical riser;

a plurality of circuit interrupters connected to said vertical risers and recessed from the front of said section structure having operating handles facing and recessed from the front of said section structure and each of said circuit interrupters being disposed vertically upright;

a plurality of circuit-interrupter enclosure means formed at the front of said section structure and each of said circuit interrupter enclosure means having at least one of said circuit interrupters disposed therein and being positioned vertically;

a plurality of front cover means for closing the front of each of said enclosure means so as to provide a dead front construction for said switchgear unit;

each of said front cover means comprising an outer portion aligned with the front of said section structure and which extends around the periphery of said front cover means, and a recessed surface flush with the front of the associated circuit interrupter and having an opening therein through which only the operating handle of the associated circuit interrupter extends; and,

said outer portions of said front cover means include a void formed therein for receiving some mounting hardware associated with said switchgear unit.

B 511,886

METHOD AND CIRCUITS FOR THE DERIVATION OF AN ANALOG SLIP FREQUENCY SIGNAL OF AN INDUCTION MOTOR IN A TACHOMETERLESS MOTOR DRIVE

Michael B. Brennen, and Alberto Abbondanti, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 3, 1974, Ser. No. 511,886

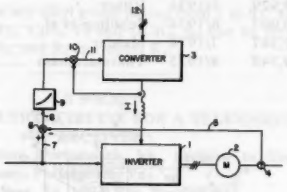
Int. Cl.² H02P 7/42

U.S. Cl. 318—231 **5 Claims**

References Cited

UNITED STATES PATENTS

3,500,158	3/1970	Landau et al.	318/227
3,512,067	5/1970	Landau	318/227
3,593,083	7/1971	Blaschke	318/227
3,718,847	2/1973	Graf et al.	318/227
3,775,652	11/1973	Bowler et al.	318/227
3,824,437	7/1974	Blaschke	318/227



1. The method of determining the slip frequency ω_2 of an induction motor supplied with current at a frequency ω_1 and imparting a torque T to a load, comprising the steps of:

sensing the value of the input current and the input voltage of the stator of the motor;

determining from said sensed current and voltage values the direct and quadrature input currents I_d, I_q; and voltages V_d, V_q;

determining E_d and E_q, the direct and quadrature air gap voltages in accordance with the relationship $E_d = V_d - I_d (R_1 + j\omega_1 L_1)$ and $E_q = V_q - I_q (R_1 + j\omega_1 L_1)$, where R_1 and L_1 are the resistance and inductance of the stator of the motor;

computing at least one of the products $E_d \cdot I_d$ and $E_q \cdot I_q$ to derive a signal N which is substantially proportional to $T\omega_1$;

integrating at least one of said determined direct and quadrature air gap voltages, E_d and E_q;

multiplying said integrated one of said air gap voltages by the other of said determined air gap voltages to derive a

signal D which is substantially proportional to the square of the corresponding non-integrated determined air gap voltages and inversely proportional to ω_1; and

dividing said signal N by said signal D to derive a signal representative of the slip frequency ω_2.

B 512,849

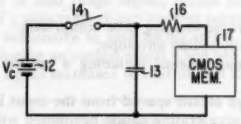
VOLTAGE MAINTENANCE APPARATUS

John Alexander Copeland, III, Watchung, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 7, 1974, Ser. No. 512,849
Int. Cl.² H03K *1/02*
U.S. Cl. 307—296 **4 Claims**

References Cited
UNITED STATES PATENTS

3,322,974	5/1967	Ahrons et al.	307/221 C
3,597,629	8/1971	Bartlett	307/238
3,636,530	1/1972	Mark et al.	307/238 X
3,870,905	3/1975	Chikazawa	307/296 X



1. In combination:

a semiconductor memory having a resistance-voltage characteristic which is similar to MOS memories;

said memory being adapted to be connected in parallel with a d-c power supply for applying to the memory a voltage V_f;

said memory being capable of storing electrical data provided the applied voltage is a minimum value V_f;

means for temporarily maintaining an applied voltage between V_f and V_i in the event of accidental disconnection of the power supply comprising a capacitor in parallel with the memory and the power supply;

and means for increasing the time during which the applied voltage can be temporarily maintained above V_f comprising a resistor which is other than any internal resistance of the capacitor, connected between the capacitor and the memory, the resistor having a resistance R substantially defined by the Equation $R = 0.4\ (V_{ci} - V_f)/I_f$ where I_f is the capacitor discharge current at voltage V_f and V_{ci} is the initial voltage across the capacitor.

B 513,368

HIGH SPEED-LOW COST, CLOCK CONTROLLED CMOS LOGIC IMPLEMENTATION

James A. Luisi, Anaheim; Clarence W. Padgett, Fountain Valley, and Dana C. Street, Placentia, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 9, 1974, Ser. No. 513,368
Int. Cl.² H03K *19/08, 19/36*
U.S. Cl. 307—205 **10 Claims**

References Cited
UNITED STATES PATENTS

3,479,523	11/1969	Pleshko	307/205
3,521,081	7/1970	Vasseur et al.	307/205
3,676,705	7/1972	Meyer	307/251
3,683,201	8/1972	Haraszti	307/205
3,740,576	6/1973	Haraszti	307/205
3,774,055	11/1973	Bapat	307/251 X
3,825,888	7/1974	Kawagoe	307/215 X

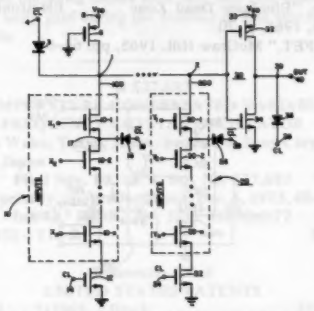
OTHER PUBLICATIONS

Boleky et al., "High-Performance Low-Power CMOS Memories Using SOS Technology"; Reprinted from IEEE J. Solid-State Circuits, Vol. SC-7, pp. 135–145, 4/1972: *Semiconductor Memories*, IEEE Press, 1972.

Surgent, "Insulated Gate Field-Effect Transistor Sense Amplifier Latch"; IBM Tech. Discl. Bull.; Vol. 13, No. 9, pp. 2670–2671; 2/1971.

Cole et al., "Logic Gate", IBM Tech. Discl. Bull.; Vol. 16, No. 2, p. 566; 7/1973.

Cole et al., "Dynamic Logic Gate"; IBM Tech. Discl. Bull.; Vol. 16, No. 2, p. 567; 7/1973.



1. A synchronous circuit for implementing functions of logic having an operating cycle comprising an active and a recovery segment and including,

source means for supplying a plurality of reference potentials,

a data node adapted to be charged to a first of said reference potentials or to be discharged to a second of said reference potentials,

a data output terminal to receive a signal thereat representative of the reference potential of said data node,

at least one semiconductor device connected between said data node and said reference potential source means,

current source means connected to said data node to charge said data node to said first reference potential, and

timing signal means connected to said at least one semiconductor device to enable said data node to be discharged through a conduction path of said at least one semiconductor device and to said second reference potential during the active segment of the circuit operating cycle,

said current source means including a source of constant current and a source of periodic current to charge said data node to said first reference potential,

said source of constant current connected to said reference potential source means to charge said data node to said first reference potential during the recovery segment of the circuit operating cycle to thereby compensate for residual leakage current from said at least one semiconductor device, and

said source of periodic current connected to said timing signal means to periodically charge said data node to said first reference potential during the recovery segment of the circuit operating cycle.

B 513,756

AMPLIFYING CIRCUIT FOR USE WITH A HIGH IMPEDANCE SOURCE TRANSDUCER

Osamu Kono, Tokyo; Takeshi Matsudaira, Kanagawa, and Makoto Ishikawa, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 336,819, Feb. 28, 1973, Pat. No. 3,862,367. This application Oct. 10, 1974, Ser. No. 513,756

Claims priority, application Japan, Mar. 2, 1972, 47-21876; Aug. 15, 1972, 47-81569

Int. Cl.² H04R *3/00*

U.S. Cl. 179—1 A **8 Claims**

References Cited

UNITED STATES PATENTS

3,300,585	1/1967	Reedyk et al.	330/35
3,378,783	4/1968	Gibson	330/35

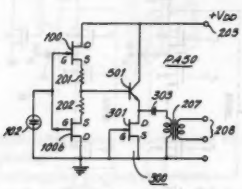
OTHER PUBLICATIONS

Gosling, "Field Effect Transistors", Wiley 1965.

N. S. (National Semiconductor), "N.S. Application Note AN 48-1', 1971.

Freiman, "Eliminate Dead Zone . . . ", Electronic Design, Sept. 26, 1968, p. 70.

Sevin, "FET," McGraw Hill, 1965, pp. 64–69.



1. An amplifying circuit for use with a signal source comprising first and second field-effect transistors which are of different conductive types, and each of which has gate, drain and source electrodes, the gate electrodes of the first and second field-effect transistors being connected to each other, a pair of resistors in series connecting the source electrodes of the first and second field-effect transistors to each other in a source follower configuration so as to present a low output impedance, means connecting the signal source between the interconnected gate electrodes of the first and second field-effect transistors and the drain electrode of the second field-effect transistor, said first and second field effect being selected to have small values of drain-source current in the absence of any gate-source bias, a third transistor which has control, output and common electrodes, means connecting said control electrode to said resistors at a connection point between the latter, a constant current source connected to said output electrode, means for supplying power to said drain electrode of said first field-effect transistor and to said common electrode of the third transistor, an output circuit connected between said output electrode of the third transistor and said drain electrode of the second field-effect transistor, said third transistor and said constant current source cooperating to provide a high load impedance for said first and second field effect transistors, and said third transistor being selected to have a relatively high common to output electrode current in the absence of any control to output electrode bias.

B 518,859

GATEABLE ELECTRON IMAGE INTENSIFIER

Vincent J. Santilli, Corning, N.Y., and James Vine, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,859

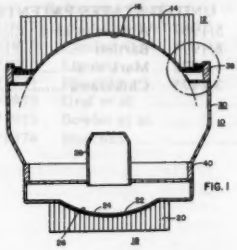
Int. Cl.² H01J *39/04, 39/02*

U.S. Cl. 313—99 **7 Claims**

References Cited

UNITED STATES PATENTS

2,994,798	8/1961	Krieger et al.	313/102
3,082,342	3/1963	Pietri	313/94 X
3,280,356	10/1966	Stoudenheimer et al.	313/94 X
3,475,076	10/1969	Nelson	313/94 X
3,801,849	4/1974	Edgecumbe	313/102



1. An electronic imaging tube comprising:

a hermetically sealed envelope;

an input image means including a curved photocathode surface;

output image means spaced from the input image means;

an annular accelerating anode positioned within said envelope between the input and output means for accelerating electrons to produce image intensification;

an annular gateable electrode disposed within said envelope between the input means and the anode, which gateable electrode includes an inwardly disposed end portion proximate to but spaced from the perimeter of the photocathode surface, which end portion extends along the radius of curvature of the photocathode surface.

B 519,932

ELECTRICAL ANGLE DELAY CIRCUIT

Curtis D. Munden, and Robert E. Campbell, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1974, Ser. No. 519,932

Int. Cl.² H03K *5/13, 5/159*

U.S. Cl. 307—293 **5 Claims**

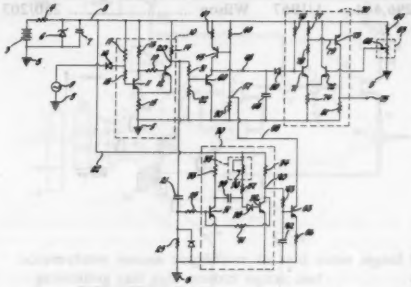
References Cited

UNITED STATES PATENTS

3,333,110	7/1967	Schanne	307/230 X
3,403,268	9/1968	Beckner et al.	307/293
3,486,043	12/1969	Johannessen	307/265
3,486,067	12/1969	Griffith et al.	307/265 X
3,571,626	3/1971	Reif	307/265
3,581,214	5/1971	Seegmiller	307/293
3,753,012	8/1973	Frederiksen et al.	307/293

1. An electrical angle delay circuit for producing an output signal which is delayed the same selectable number of electri-

cal degrees from the positive to negative polarity zero crossover point of each cycle of all frequencies of a variable frequency alternating current input signal comprising: circuit means responsive to said alternating current input signal for producing a direct current potential synchronizing signal having leading and trailing edges corresponding to the negative to positive polarity zero crossover point and to the positive to negative polarity zero crossover point, respectively, of each cycle of said alternating current input signal; circuit means responsive to said leading edge of said synchronizing signals for producing a range signal of a direct potential level



directly proportional to the frequency of said alternating current input signal; timing circuit means arranged to be electrically influenced by said range signal for producing a direct current potential ramp timing signal which is initiated at the positive to negative polarity zero crossover point of each cycle of said alternating current input signal and increases linearly in potential level at a rate determined by the potential level of said range signal; means for producing a delay signal of a selectable direct current potential level; and circuit means responsive to said timing signal and said delay signal for producing an output signal when the potential level of said timing signal increases to that of said delay signal.

B 519,979

TELEVISION SIGNAL AMPLIFIER APPARATUS FOR COUNTERACTING EFFECTS OF UNWANTED SIGNAL COMPONENTS

Eric R. Woods, and Russell G. Thompson, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Nov. 1, 1974, Ser. No. 519,979
Int. Cl.² H04N *3/16*
U.S. Cl. 178—7.1 **10 Claims**

References Cited
UNITED STATES PATENTS

2,829,247	4/1958	Thomas	178/DIG. 12
3,735,035	5/1973	Kowalski et al.	178/DIG. 12
3,812,289	5/1974	Avins	178/7.3 R

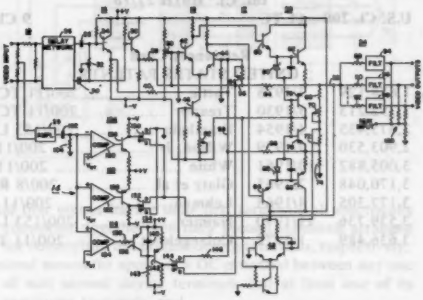
1. Television signal amplifier apparatus for counteracting the effects of unwanted signal components which can be introduced in the course of routing and processing of television signals having portions representing black and white picture regions and synchronizing signals, said apparatus comprising

a. video signal amplifier means for amplifying said television signals, said amplifier means having an input and an output,

b. first means responsive to said television signals at said input for detecting when said television signals represent the white region and are greater in absolute value than the value corresponding to a certain signal level in said white region,

c. second means responsive to said television signals at said input for detecting when said television signals represent the black region and are greater in absolute value than the value corresponding to a certain signal level in said black region,

d. third means responsive to said television signals at said input for detecting the occurrence of said synchronizing signals thereof,



e. switching means connected at said output operated by said first and second means for preventing the transmission of signals at said output when said signal levels are greater either than said certain signal level in said white region or said certain signal level in said black region, and

f. means operated by said third means for reducing the gain of said amplifier means such that said gain does not exceed unity gain during the absence of said synchronizing signals.

B 527,693

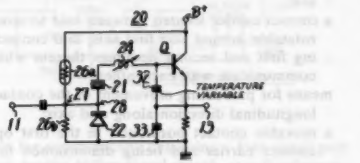
TEMPERATURE COMPENSATED VARIABLE FREQUENCY CRYSTAL OSCILLATOR

Toshihiko Waku, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,693
Claims priority, application Japan, Dec. 5, 1973, 48-138442
Int. Cl.² H03B *5/04, 5/36;* H03C *3/22*
U.S. Cl. 331—116 R **5 Claims**

References Cited
UNITED STATES PATENTS

3,373,379	3/1968	Black	331/176 X
3,569,865	3/1971	Healey	331/177 V X



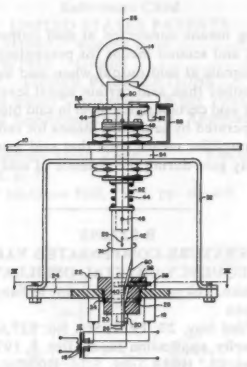
1. A variable frequency oscillator comprising a first series circuit including a resonator made of lithium tantalate, variable inductance means and first variable capacitance means whose capacitance varies linearly with temperature variations; a second series circuit connected in parallel to said first series circuit and including second capacitance means whose capacitance varies with said temperature variations in accordance with a second order relationship which is graphically represented by a second degree curve opening upward; and a tran-

sistor having its base electrode connected to said parallel connected first and second series circuits.

B 531,425
NON-LOAD TAP-CHANGER SWITCH
Edgar R. Eley, Jefferson City, Mo., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 10, 1974, Ser. No. 531,425
Int. Cl.² H01H *21/18*
U.S. Cl. 200—11 TC **9 Claims**

References Cited
UNITED STATES PATENTS

1,678,129	7/1928	Tuttle	200/11 TC UX
1;752,213	3/1930	Treanor	200/11 TC UX
2,675,435	4/1954	Framhein	200/153 LA X
2,903,530	9/1959	Wilson, Jr.	200/11 TC
3,005,882	10/1961	White	200/11 EA
3,170,048	2/1965	Glatz et al.	200/8 R UX
3,177,305	4/1965	Lehman	200/11 B X
3,539,736	11/1970	Naimer	200/153 LA X
3,636,489	1/1972	Colangelo et al.	200/11 TC X

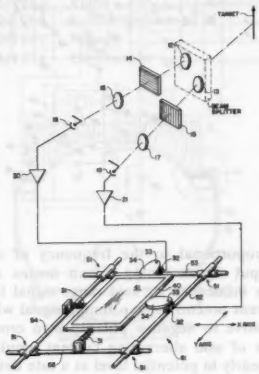


1. A non-load tap-changer for tapped electrical windings, comprising:
a plurality of terminals;
means for supporting said terminals in an arc around a first axis;
a contact carrier located between said terminals and being rotatable around said first axis, said contact carrier having first and second openings therein which conjointly communicate with each other;
means for preventing movement of the contact carrier in a longitudinal direction along said axis;
a movable contact positioned in the first opening of the contact carrier and being dimensioned to contact two adjacent terminals;
a shaft extending into the second opening in the contact carrier, said shaft having an inclined surface thereon which is engageable with the movable contact;
means for permitting manual longitudinal movement of the shaft along said axis and manual rotational movement around said axis; and
resilient means for forcing the shaft and the inclined surface thereon in a longitudinal direction, with the inclined surface being in contact with and exerting an outward radial force on the movable contact when the movable contact is engaged with the two adjacent terminals.

B 533,580
IMAGE STABILIZATION SYSTEM
Carl Orlando, New Shrewsbury, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 17, 1974, Ser. No. 533,580
Int. Cl.² G03B *39/00*
U.S. Cl. 354—70 **5 Claims**

References Cited
UNITED STATES PATENTS

2,774,961	12/1956	Orlando	250/210 X
3,293,439	12/1966	Marantette et al.	250/203 R
3,296,444	1/1967	Wilson	250/203 R



1. An image stabilization system for maintaining a fixed relationship between a target to be photographed and an image of the target to be recorded on a photographic film comprising: p1 a. a primary lens system for receiving light rays from said target and for splitting said light rays into first and second light beams;
b. first and second optical density wedges each having a scale of continuous linear density gradations, said wedges being positioned with their respective scales at angles to each other and in position for said first wedge to transmit said first light beam and said second wedge to transmit said second light beam;
c. first and second photo-electric means responsive to said first and second transmitted light beams, respectively, for producing variable first and second output voltages; and
d. means responsive to said first and second output voltages for moving said photographic film in all directions on a given plane in consonance with the variations in said first and second output voltages.

B 534,016
DIGITAL AUTOMATIC GAIN CONTROL CIRCUIT
Gardner D. Jones, Jr., Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 18, 1974, Ser. No. 534,016
Int. Cl.² G06F *5/00*
U.S. Cl. 235—154 **12 Claims**

References Cited
UNITED STATES PATENTS

3,562,504	2/1971	Harris	235/154

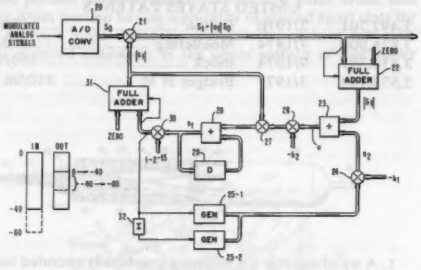
1. A digital gain control circuit suitable for use in a digital signal processor such as a digital demodulator comprising:

a multiplier for forming the product of an uncontrolled digital input signal and a digital gain control signal;

a feedback loop responsive to the magnitude of the output of the said multiplier and a digital reference for generating the said digital gain control signal;

said feedback loop including;

means for forming an error signal corresponding in magnitude and sign to the difference between the magnitude of the multiplier output and the said reference;



accumulator means responsive to said error signal for generating said gain control signal; and

a feedback control loop responsive to the sign of the accumulator output for modifying the sign of the reference to cause said error signal to assume alternate negative and positive fixed values when the multiplier output falls to zero for a predetermined period of time.

B 534,767

APPARATUS FOR TESTING MULTICONDUCTOR CABLES FOR CONTINUITY, CORRECT CONNECTIONS, AND THE ABSENCE OF SHORT CIRCUITS BETWEEN CONDUCTORS

Henry Edge Vaiden, Winston-Salem, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 20, 1974, Ser. No. 534,767
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **9 Claims**

References Cited
UNITED STATES PATENTS

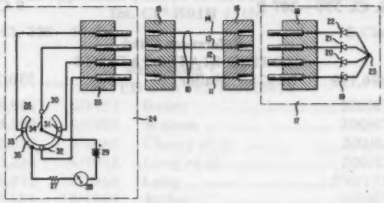
2,635,135	4/1953	Lamont	324/73
2,666,898	1/1954	Meldal	324/66
2,814,774	11/1957	Wong	324/51
2,822,519	2/1958	Murphy	324/66
2,964,701	12/1960	Argabright	324/51
3,217,244	11/1965	Glover	324/51
3,594,635	7/1971	Minamii et al.	324/51
3,600,673	8/1971	Kohke	324/51
3,728,616	4/1973	Cheek et al.	324/51
3,746,973	7/1973	McMahon	324/51
3,818,329	6/1967	Reaves	324/51

FOREIGN PATENTS OR APPLICATIONS

189,684	4/1957	Austria	324/66
924,432	4/1963	United Kingdom	324/66
130,580	11/1959	U.S.S.R.	324/66

5. Apparatus for testing the electrical continuity between terminals on a first device and terminals on a second device where said first device terminals should be connected in a preassigned order to a plurality of conductors and said second device terminals should likewise be connected in a preassigned order to said conductors, said apparatus comprising:

a plurality of first means, each having first and second terminals, each responsive to a first current flowing in a first direction between said terminals to produce a first voltage drop which is unique to said first voltage drops of all other of said first means and each responsive to a second current flowing in a second direction between said terminals to produce a second voltage drop where all of said second voltage drops of said first means are substantially equal,



said first means having their first terminals all electrically connected together and their second terminals arranged for connection to said first device terminals, respectively,

second means for applying a DC potential between any one of said second device terminals and at least one of its remaining terminals, and

third means for indicating the current flowing from said source.

B 541,415

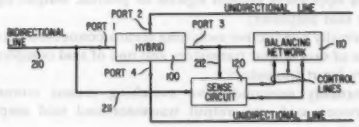
AUTOMATIC CABLE BALANCING NETWORK

Richard Larry Ukelley, Englishtown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1975, Ser. No. 541,415
Int. Cl.[2] H04B *1/52*
U.S. Cl. 179—170 D **10 Claims**

References Cited
UNITED STATES PATENTS

2,302,374	11/1942	Mitchell	179/170 D
2,303,419	12/1942	Affel	179/170 D
3,178,521	4/1965	Brown	179/170 D
3,824,501	7/1974	Harris	333/18
3,875,350	4/1975	Fischer	179/170 D



1. Apparatus for automatically balancing a four signal port hybrid network having bidirectional signals at a fixed preselected one of said signal ports, comprising:

a balancing impedance network connected to a second preselected one of said signal ports of said hybrid network, and exhibiting a prechosen impedance having a preselected number greater than one of variable impedance parameters; and

a sense circuit responsive to signals present on said first and second preselected signal ports of said hybrid network for developing impedance control signals equal in number to said preselected number to control said impedance parameters, respectively.

B 553,460

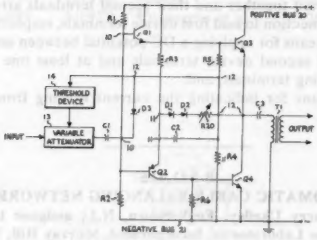
POWER AMPLIFIER HAVING PROTECTIVE CIRCUITS

William B. Crockett, and Otward Mueller, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Feb. 27, 1975, Ser. No. 553,460
Int. Cl.² H03F 3/18
U.S. Cl. 330—207 P **9 Claims**

References Cited
UNITED STATES PATENTS

3,596,199	7/1971	Hafler	330/207 P



1. In a transistorized power amplifier comprising:

a. an input for said amplifier;

b. a pair of complementary input transistors connected to said input to supply oppositely phased signals in response to an input signal applied to said amplifier input;

c. a pair of output transistors having input circuits respectively connected to said complementary input transistors, said output transistors being responsive respectively to said oppositely phased signals to provide output signals for said amplifier;

d. normally conductive switching means connected between one of said output transistors and one of said complementary input transistors;

e. normally nonconductive switching means connected between said one output transistor and said amplifier input;

f. said normally conductive switching means becoming nonconductive in response to an overload or an overdrive applied to said amplifier, and said normally nonconductive switching means becoming conductive in response to said normally conductive switching means becoming nonconductive; an improved restoral circuit comprising:

g. a threshold device having an input connected to said one output transistor and having an output that produces a threshold signal in response to a predetermined voltage at its input;

h. and an attenuator connected to said amplifier input, said attenuator having a control input connected to said threshold output for reducing the magnitude of input signals applied to said amplifier input in response to said threshold signal.

B 560,765

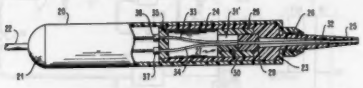
WAND FOR READING OPTICALLY ENCODED GRAPHIC SYMBOLS

Robert L. Cowardin, Cary, and George J. Laurer, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1975, Ser. No. 560,765
Int. Cl.² G02B 5/14
U.S. Cl. 250—227 **11 Claims**

References Cited
UNITED STATES PATENTS

3,497,701	2/1970	Dalton	250/227
3,826,900	7/1974	Moellering	250/568
3,834,391	9/1974	Block	350/96 C
3,871,744	3/1975	Bridger et al.	350/96 WG



1. A wand suitable for scanning graphically encoded indicia and providing electric signals which are an analog of the graphically encoded indicia comprising:

first, second and third substantially cylindrical optically conductive fibers;

a first retainer including means for locating said first and second fibers with respect to a reference dimension of said first retainer such that the said first and second fibers are in contact along a line which includes common tangent points on the substantially cylindrical surfaces of the fibers and the line of contact is coincident with the said reference dimension;

a second retainer including means for locating said third fiber with respect to a reference dimension substantially identical to the first retainer such that the axis of the cylindrical third fiber is coincident with the said reference dimension;

a support for supporting said first and second retainers in juxtaposition such that the said respective reference dimensions are in alignment whereby the point of tangency of the said first and second fiber coincides with the axis of the said third fiber;

a housing for retaining said support, positioning said third fiber in a substantially elongated position, supporting a light source and a photodetector; and

means for connecting the free end of the first and second fibers to the light source and the photodetector, respectively.

B 579,806

RESILIENT TAPE GUIDE ASSEMBLY FOR ROTARY HEAD TAPE RECORDING AND/OR REPRODUCING APPARATUS

Akio Serizawa, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

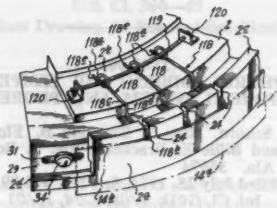
Continuation of Ser. No. 444,362, Feb. 20, 1974, abandoned.
This application May 22, 1975, Ser. No. 579,806
Claims priority, application Japan, June 13, 1973, 48-67583
Int. Cl.² G11B 15/60
U.S. Cl. 360—130 **19 Claims**

References Cited
UNITED STATES PATENTS

3,643,849	2/1972	Roberts	226/199
3,800,318	3/1974	Jantzen	360/84

16. In a tape recording and/or reproducing apparatus having a tape guide drum including upper and lower drum portions which are spaced apart along the periphery of the guide

drum for defining a circumferential gap, and at least one rotary transducer projecting through said gap for recording and/or reproducing signals on a tape running against said periphery of the guide drum in a path which extends about at least a portion of said periphery; a guide assembly for the tape on said drum comprising rigid guide means extending along said portion of the drum periphery and engageable by one longitudinal edge of the tape in said path for establishing the direction and location of said path, and a plurality of elongated resilient guide elements spaced apart along at least part of said portion of the periphery of said tape guide drum, said upper drum portion having a plurality of spaced apart slots for said resilient guide elements, respectively, each of said slots being directed outwardly in the upper surface of said upper



drum portion and opening at said upper surface and at said periphery of the tape guide drum, and each of said resilient guide elements including an inner end portion secured to said upper surface of the upper drum portion at a respective location spaced inwardly from said periphery, an intermediate portion extending outwardly in respect to said guide drum from said inner end portion through the respective one of said slots and being resiliently movable independently of the other resilient guide elements in a plane substantially at right angles to said path, and a contact end portion at the outer end of said intermediate portion projecting from the respective slot beyond said periphery and acting yieldably against the other longitudinal edge of the tape in said path for holding the tape in contact with said rigid guide means while accommodating variations and changes in the width of said tape.

B 585,247

ELECTRICAL SWITCH CONSTRUCTION

John W. Stearley, Grove City, and Roger L. Warner, Union Township, both of Ohio, assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 298,020, Oct. 16, 1972, abandoned. This application June 9, 1975, Ser. No. 585,247

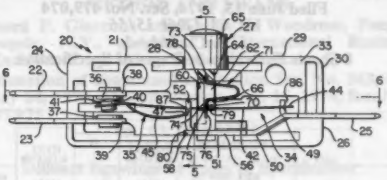
Int. Cl.[2] H01H *13/36*

U.S. Cl. 200—67 D 8 Claims

References Cited

UNITED STATES PATENTS

2,556,981	6/1951	Raney	200/67 D
3,094,594	6/1963	Watson	200/67 D
3,382,332	5/1968	Cherry et al.	200/67 B
3,400,234	9/1968	Long et al.	200/67 B
3,485,975	12/1969	Long	200/153 V
3,487,184	12/1969	Arthur	200/67 D



1. An electrical switch construction comprising a housing means, a movable switch blade means carried by said housing means, and a movable actuator means carried by said housing means for causing movement of said switch blade means between operating positions thereof upon movement of said actuator means between operating positions thereof, said actuator means having spring means for engaging against said blade means and moving said blade means in unison therewith as said actuator means moves in unison therewith in one direction to a predetermined position relative to said housing means and for thereafter preventing further movement of said blade means in said one direction even though said actuator means is further moved in said one direction beyond said predetermined position, said spring means comprising a reversely bent single leaf spring member having an elbow and opposed ends, said actuator means having a chamber therein that intersects with a side slot thereof and an end slot thereof, said spring member being disposed in said chamber and having said elbow thereof extending out of said side slot and one opposed end thereof extending out of said end slot to engage said blade means.

DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 3, 1976

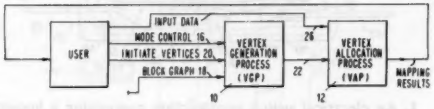
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T943,001
DYNAMIC REDUNDANCY METHOD FOR AN AUTOMATED LOGIC MAPPING SYSTEM

Angelo Mennone, Croton-on-Hudson, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 13, 1974, Ser. No. 479,074
Int. Cl. G06f *15/56*
U.S. Cl. 444—1
8 Sheets Drawings. 36 Pages of Specification



An automated circuit design system and process are provided including a technique for introducing redundancy of circuit element groups during the allocation of the circuit element groups to modules. The redundancy technique, which is embodied as a computer algorithm, functions when the allocation of redoundable element such as a circuit element group is made to a container module such as a circuit chip, during a discrete step allocation procedure which is designed to produce a mapping of a set of connected circuit elements. A minimum condition for obtaining a successful mapping is that each element can be allocated to at least one module. The operation of the process is made redundant to reduce the number of elements by one, namely the allocated element. The consequence of the operation is that the connected elements said to be fed by the redundant element (referred to as sink elements) are each combined by union with the redundant element. Other concomitant results of the operation are that the connections previously required between the redundant element and its sink elements will not be needed should any of the sink elements be allocated to different modules, and each sink element has acquired the attributes of the redundant element.

T943,002
PROCESS FOR THE OXIDATION OF OLEFINICALLY UNSATURATED COMPOUNDS TO CARBONYL COMPOUNDS

Hugh J. Hagemeyer, Jr., and Frank C. Canter, both of P.O. Box 2068, Longview, Tex. 75603, and Ronald A. De Jean, % Alpart, Spun Tree, Jamaica, British West Indies

Continuation of abandoned application Ser. No. 858,186, Sept. 15, 1969. This application June 26, 1974, Ser. No. 483,473

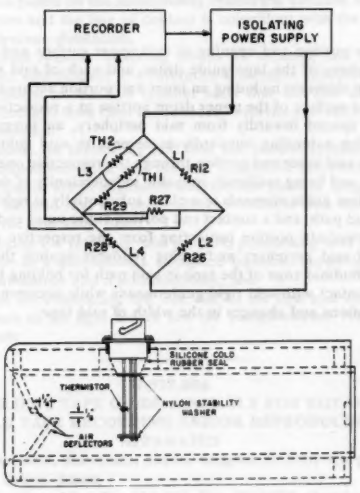
Int. Cl. C07c *47/06*
U.S. Cl. 260—604 AC
No Drawing. 21 Pages of Specification

A process for the oxidation of olefinically unsaturated compounds to carbonyl compounds comprising contacting the olefinically unsaturated compounds with an aqueous oxidizing agent in the presence of a catalyst comprising an aqueous solution which includes a catalytically active palladium compound, cupric chloride, and sufficient insoluble cuprous chloride to provide a heterogeneous aqueous catalyst solution having an absolute emf value of about 260 to about 400 mv.

T943,003
ATMOSPHERIC AMBIENT AIR TEMPERATURE MONITORING SYSTEM AND PROBE THEREFOR

Victor J. Schorn, Rte. 5, Box 323-B, Florence Ala. 35630, and Billie E. Brackeen, Rte. 4, Box 47, Tuscumbia, Ala. 35674

Filed July 25, 1974, Ser. No. 491,791
Int. Cl. G01k *1/08, 7/24, 13/02*
U.S. Cl. 73—362 AR
7 Sheets Drawings. 10 Pages of Specification



An aircraft-mounted air temperature measuring system (FIG. 1) having an effective linear temperature/resistance response of about ±0.15° C. over its full span of about −30° F. to about 120° F., comprising a probe housing for a dual element thermistor, said thermistor being a part of one of four legs of an electrical bridge in combination with readout means, power supply means, and a load resistor connected against two junctions of said bridge to provide voltage reading for said readout means. The bridge circuit is provided with switching for 8 ranges and is easily calibrated. Improved readout accurracy and resolution is obtained by using a readout device having a full-scale range that is only a portion of

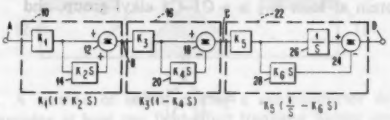
the total range of the thermistor-bridge combination. The use of multiple resistor in two legs of the bridge permits a switch, inserted between one end of the load resistor and a junction of two legs of said bridge, to change the location of the effective junction between said two legs. Variable resistors in these said two legs permit vernier adjustment of this location. Design of the probe housing (FIG. 6) minimizes interference from radiant heat energy, thereby enabling the thermistor sensor to respond only to the heat energy contained in the air flowing thereover.

T943,004

READ SIGNAL EQUALIZATION OR COMPENSATION NETWORK

Richard C. Schneider, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1974, Ser. No. 493,189
Int. Cl. G11b *5/45*
U.S. Cl. 360—65
1 Sheet Drawing. 15 Pages of Specification



Read signal from a magnetic recording head is equalized or compensated by the circuit shown herein to substantially reproduce the signal recorded on magnetic tape. The equalization circuit must compensate for the derivative function inherent in the head and must also compensate for high frequency roll-off and phase distortion. The derivative function performed by the magnetic read head is compensated by an integration function **22**. The high frequency roll-off and phase distortion is compensated by a series of circuits **10** and **16** having in LaPlace transforms a transfer function of the form

$$(1+AS)(1-BS)$$

where A and B are constants, and S is the frequency variable $j\omega$. Phase distortion in the read signal appears in the form of asymmetrical pulses. Constants A and B in the above transfer function may be varied by varying circuit components in the equalization network to eliminate the asymmetry in the read signal. In particular, the function $(1+AS)$ may be used to shape the trailing edge of the read signal pulse, while the function $(1-BS)$ may be used to shape the leading edge of the read signal pulse.

T943,005

METHOD OF BUILDING A RADIAL TIRE

John D. Smithkey, Jr., 1271 Overland Ave. NE., North Canton, Ohio 44720

Filed Aug. 14, 1974, Ser. No. 497,544
Int. Cl. B29h *17/14*
U.S. Cl. 156—123
1 Sheet Drawing. 5 Pages of Specification

A method of building a radial tire by the flat band method normally employed in the construction of bias and bias-belted tires. The radial tire is provided with a belt structure having at least one belt ply reinforced with cords which (I) have a high modulus of elasticity of at least 220 grams per denier, and (II) are disposed at angles in the range of from 16 to 32 degrees measured in relation to a plane containing the mid-circumferential centerline of the tread of the tire when molded, vulcanized and uninflated. The belt plies with high modulus cords of, for example, steel, glass, or aramid, are represented in dotted line in the drawing. The belt plies, other than those with high modulus cords, are reinforced with cords having a lower modulus of elasticity not exceeding 200 grams per denier. The belt plies with

the lower modulus cords of, for example, rayon, nylon, or polyester, are represented in full, solid line in the drawings.

T943,006

DYNAMIC PRIORITY QUEUEING MECHANISM METHOD AND MEANS

Leonard F. Giaccone and Luther J. Woodrum, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of abandoned application Ser. No. 363,680, May 24, 1973. This application Aug. 16, 1974, Ser. No. 497,975
Int. Cl. G06f *7/06*
U.S. Cl. 444—1
8 Sheets Drawing. 64 Pages of Specification

MATRIX Q

INDICES					
(0001)	1	P1	V1	E1
(0010)	2	P2	V2	E2
(0011)	3	P3	V3	E3
(0100)	4	P4	V4	E4
(0101)	5	P5	V5	E5
(0110)	6	P6	V6	E6
(0111)	7	P7	V7	E7
(1000)	8	P8	V8	E8
(1001)	9	P9	V9	E9
(1010)	10	P10	V10	E10
(1011)	11	P11	V11	E11

Electronically inserting a queue element with any queue service value into a queue having a unique binary tree structure, and/or removing from the queue its element currently having the lowest (highest) service value in the queue. The queue elements are inserted as vertices of a binary tree structure in which the queue is ordered by the service values of its elements. Each queue element has fields which contain its queue service value V, a path order bit P, and either the item being queued by the queue element or a pointer to the item.

T943,007

RIGID UNSATURATED POLYESTER CELLULAR MATERIAL

Don R. Leonard, Rte. 15, 421 Old Castle Road, Kingsport, Tenn. 37660, and Lee H. Davis, 8143 NW. Twin Oaks Drive, Kansas City, Mo. 64151

Filed Aug. 27, 1974, Ser. No. 500,998
Int. Cl. C08f *283/00*
U.S. Cl. 260—2.5 N
No Drawing. 8 Pages of Specification

A composition for producing rigid, cellular plastics from unsaturated polyesters is disclosed. According to

the disclosure, an unsaturated polyester produced from a glycol, an unsaturated acid or anhydride, and optionally a saturated acid, is mixed with a polymerizable vinyl monomer, a silicone surfactant, a curing catalyst, and a polymercaptan. The mixture is capable of being mechanically frothed, and subsequently cured to produce a rigid, cellular, low density product having a desirable cell structure and good physical properties.

T943,008

METHOD FOR MANUFACTURING TOOL ALLOYS BY POWDER METALLURGY

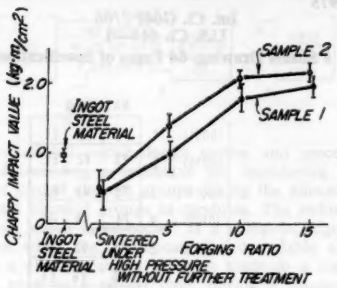
Hisao Hara, Kumagaya, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,255

Claims priority, application Japan Sept. 12 1972 48/102,124

Int. Cl. B22f 7/06
U.S. Cl. 148—11.5

1 Sheet Drawing. 9 Pages Specification



A method for manufacturing tool alloys by powder metallurgy, wherein alloys in powder form are filled in containers or sintered, and the containers containing the powder alloys therein or the coherent solid bodies thus sintered are subjected to hot plastic working until the reduction of area exceeds 80%. The method is effective to produce tool alloys having high performance including high wear resistance, high heat resistance and high toughness which exhibit efficient performance.

T943,009

STABILIZED SPANDEX POLYMERS

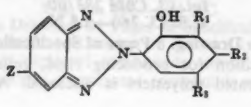
Andrew I. Smith, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation of abandoned application Ser. No. 424,249, Dec. 12, 1973. This application Sept. 13, 1974, Ser. No. 505,446

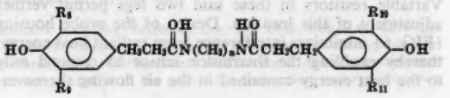
Int. Cl. C08k 6/00
U.S. Cl. 260—45.8 NT

No Drawing. 10 Sheets Specification

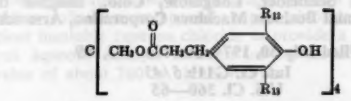
Spandex polymer is stabilized by incorporating therein synergistic amounts of a hindered phenol and a benzotriazole having the following formula:



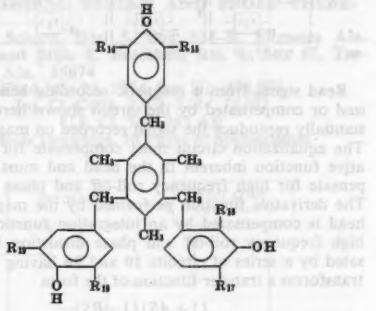
wherein Z is hydrogen or halogen, R_1 is hydrogen or C1–C8 alkyl, and R_2 is hydrogen or hydroxyl, and R_3 is hydrogen or C1–C8 alkyl. Exemplary hindered phenols are:



wherein at least R_8 and R_{10} are C1–C8 alkyl groups, and n is an integer greater than 0 and less than 15,



wherein at least R_{12} is a C1–C8 alkyl group, and



wherein at least R_{14}, R_{16} and R_{18} are C1–C8 alkyl groups. R_9, R_{11}, R_{13}, R_{15}, R_{17} and R_{19} are preferably also C1–C8 alkyl groups, but may be hydrogen. In all cases, t-butyl is the preferred alkyl group.

T943,010

FOAMABLE CHLORHEXIDINE-CONTAINING SYSTEM

Nicholas Rocko Pettoruto, Wilmington, Del., assignor to ICC United States Inc., Wilmington, Del.

Filed Sept. 18, 1974, Ser. No. 507,196

Int. Cl. A61k 31/205
U.S. Cl. 424—316

No Drawing. 9 Pages Specification

An aqueous, foamable chlorhexidine-nonionic/cationic surfactant system is presented which can be used to form germicidal foams over long periods of time. Aqueous systems containing chlorhexidine [1,6-di-(4-chlorophenylidiguanido)hexane] salts are combined with nonionic or cationic surfactants having an HLB of at least 10 and preferably in the range of 12–18. Preferred surfactants are selected from combinations of polyoxyethylene ethers or partial hexitan esters of fatty acids having 12–24 carbon atoms, fatty alcohols, and polyoxyethylene derivatives of fatty alcohols having 10–18 carbon atoms, polyhydric materials such as sorbitol and carboxyl-vinyl polymers are included.

REISSUES

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,703

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

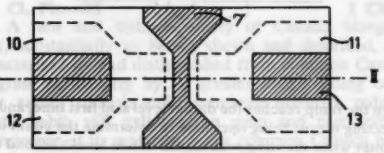
Ties Siebolt te Velde, and Hein Koelmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Original No. 3,481,030, dated Dec. 2, 1969, Ser. No. 630,026, Apr. 11, 1967. Application for reissue May 4, 1970, Ser. No. 34,484

Claims priority, application Netherlands, Apr. 14, 1966, 6604963; Dec. 2, 1969, 3481030

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **12 Claims**



1. A method of manufacturing a semiconductor device comprising at least one field-effect transistor having source, drain and gate electrodes coupled to a semiconductor layer, [comprising providing on a surface of a semiconductor layer;] comprising providing on a surface of a semiconductor layer at least part of a gate electrode in a thickness capable of blocking impinging ions or electrons leaving exposed semiconductor surface portions on opposite sides of the gate, subjecting the said gate and the said exposed surfaces of the semiconductor layer on opposite sides of the provided gate electrode to ion or electron bombardment to modify the conductivity of the exposed semiconductor surface portions while the said gate blocks the underlying surface portions from receiving said bombardment, and providing on the said surfaces of modified conductivity and spaced from the gate electrode ohmic contacts to form source and drain contacts, the surfaces of modified conductivity forming source and drain electrodes spaced apart by the width of the gate electrode in the completed device.

Re. 28,704

SEMICONDUCTOR DEVICES

David Phythian Robinson, Meopham; Julian Robert Anthony Beale, Reigate; John Martin Shannon, Whyteleafe; John Anthony Kerr, East Grinstead, all of England, and Mukunda Behari Das, University Park, Pa., assignors to U.S. Philips Corporation, New York, N.Y.

Original No. 3,653,978, dated Apr. 4, 1972, Ser. No. 805,275, Mar. 7, 1969. Application for reissue Mar. 22, 1974, Ser. No. 453,876

Claims priority, application United Kingdom, Mar. 11, 1968, 11845/68

Int. Cl.² H01L *7/54*

U.S. Cl. 148—1.5 **21 Claims**

1. A method of manufacturing at least one insulated gate field effect transistor, comprising forming in a semiconductor body portion of one conductivity type adjacent a surface thereof by introducing opposite-type forming impurities therein spaced first and second low resistivity regions of the opposite conductivity type to constitute at least part of source and drain electrodes of the transistor, implanting ions of an impurity element in a third surface-*adjacent* region of the body portion extending between the first and second regions [to determine the conductivity thereof] to form at least a portion of a [current-carrying] channel *region located in the third region and whose conductivity is determined by the implanted ions and which functions to carry current* between the source and drain electrodes *when appropriate potentials are applied to the transistor*, providing a gate electrode on an insulating layer on said surface and extending over at least said portion of the channel *region*, and making electrical connections to the low resistivity source and drain electrodes, and to the gate electrode.

Re. 28,705

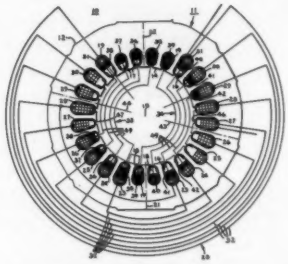
STATOR SLOT AND WINDING ARRANGEMENTS

William R. Hoffmeyer, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Original No. 3,633,056, dated Jan. 4, 1972, Ser. No. 56,926, July 21, 1970. Continuation-in-part of Ser. No. 805,625, March 10, 1969, abandoned. Application for reissue Dec. 27, 1973, Ser. No. 428,829

Int. Cl. H02k *17/28*

U.S. Cl. 310—180 **19 Claims**



1. For use in an alternating current motor; a stator including:

[a.] a core of magnetic material having a plurality of substantially angularly spaced apart, coil-accommodating slots;

[b.] a distributed *primary* winding arranged in a plurality of said slots and including at least [two] *one first* coil [groups] *for* defining [at least two] *a* predetermined magnetic [poles] *pole of a first instantaneous polarity, and at least one second coil for defining a predetermined magnetic pole of a second instantaneous polarity*;

[c.] each of [said at least two] *the* predetermined magnetic poles having a radial polar axis, with [said] *the* radial polar axes being substantially angularly spaced apart around said core; and

[d. said at least two coil groups] *the at least one first and second coils* being arranged generally concentrically about one of [said] *the* radial polar axes [about an] *and having portions thereof spanning an arcuate extent in excess of 180 electrical degrees and arranged* to leave a preselected polar region of said core in the vicinity of the other of [said] *the* radial polar axes free of [said at least two coil groups] *the at least one first and second coils*.

Re. 28,706

TRIPLE-SLOPE ANALOG-TO-DIGITAL CONVERTERS

Howard Anthony Dorey, Godalming, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

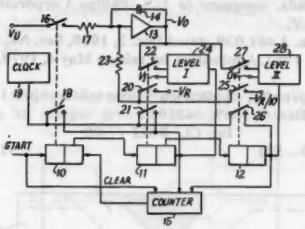
Original No. 3,737,892, dated June 5, 1973, Ser. No. 232,883, Mar. 8, 1972. Division of Ser. No. 764,790, Oct. 2, 1968. Application for reissue May 23, 1975, Ser. No. 580,401

Claims priority, application United Kingdom, Oct. 27, 1967, 48988/67

Int. Cl.[2] H03K 13/02, 13/20

U.S. Cl. 340—347 NT 4 Claims

1. An analog-to-digital converter comprising an integrating means having an input and an output, means for applying an analog input signal to be converted to the input of the integrating means to drive the integrating means output from a datum level to a level dependent upon the magnitude of the input signal, a source of a reference signal, means for applying the reference signal to the input of the integrating means to drive the integrating means output to the datum level and thereby generate a ramp function, a counter, means for generating clock pulses, means for causing clock pulses to be counted by the counter during an interval commencing with the application of the reference signal, means for applying a first increment to the ramp function before the ramp reaches the datum level a first time, means for detecting when the ramp reaches the datum level, means for applying to the ramp function a second increment equal in magnitude but opposite in polarity to said first increment, and means for scaling down the reference signal and the numerical weighting with which the clock pulses are counted by a common factor, the means for applying the second increment and the means for scaling down the reference signal and the numerical weighting of the clock pulses being responsive to operation of said detecting means



when the ramp reaches the datum level said first time, and said detecting means being operative to determine the count in the counter when the ramp reaches the datum level a second time, whereby the count in the counter when the ramp reaches the datum level said second time provides a digital representation of the analog signal magnitude.

PLANT PATENTS

GRANTED FEBRUARY 3, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,828

CANADA BLUEGRASS PLANT

Arden Wayne Jacklin, Spokane, Wash., assignor to The Vaughan-Jacklin Corporation, Spokane, Wash.

Filed Oct. 17, 1974, Ser. No. 515,597

Int. Cl. A01h *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Canada bluegrass plant, substantially as herein shown and described, and characterized by and distinguished from common Canada bluegrass particularly by its greater seed yielding capability, earlier anthesis and disseminule maturity, reduced growth habit, stiff yellow-green stem and rust colored inflorescence at its maturity, while common Canada bluegrass is still immature, and an inflorescence which is a pyramidal open panicle with main axis moderately erect.

3,829

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 11, 1974, Ser. No. 514,313

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—25 **1 Claim**

1. A new and distinct cultivar of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an abundantly branched habit of growth, vigorous growth, abundantly doubled flowers of Shrimp Red which are approximately 2½ inches to 3 inches in size when fully opened, having very little fragrance.

PATENTS

GRANTED FEBRUARY 3, 1976

ERRATA

For CLASS	See PATENT NO.
128–002.05 C	3,935,984
416–095	3,936,222
416–220	3,936,234
425–038	3,936,251
426–066	3,936,364
424–283	3,936,563
219–068	3,936,653
219–073	3,936,654
219–073	3,936,655
219–076	3,936,656
219–136	3,936,657
219–216	3,936,658
219–413	3,936,659
219–459	3,936,660
219–528	3,936,661
231–061.12 N	3,936,662
235–150.51	3,936,663
235–151	3,936,664
235–151.3	3,936,665
235–151.3	3,936,666
235–185	3,936,667
240–004.2	3,936,668
240–004.2	3,936,669
240–041.3	3,936,670
240–046.59	3,936,671
240–047	3,936,672
330–017	3,936,731
340–001 R	3,936,791

PATENTS

GRANTED FEBRUARY 3, 1976

ERRATA

PATENTS

GRANTED FEBRUARY 3, 1976

NOTE—A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,935,596

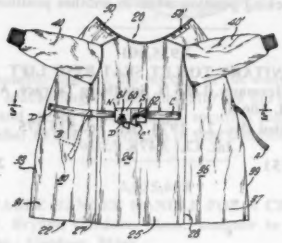
SURGICAL GOWN WITH TRANSFER DEVICE

Douglas Allen, Jr., Somerset; Richard F. Caffrey, Gladstone, and J. Philip Scanlon, Lawrenceville, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 6, 1974, Ser. No. 521,431

Int. Cl.² A41D *13/00*; **A41B** *9/00*

U.S. Cl. 2—114 **19 Claims**



1. A surgical gown comprising a main sheet having sleeves attached thereto, said main sheet comprising a central panel and two side panels, said gown having outer belt means comprising two tie strings and a disposable belt engaging means, one end of one of said two tie strings being attached to the outer surface of said gown near the point where a first of said two side panels meets the central panel and one end of the other of said two tie strings being attached to the outer edge of the second of said two side panels, said belt engaging means being adapted to releasably grasp, and sequentially release, the free ends of said tie strings.

3,935,597

WEARING APPAREL HOOD

Edmee G. Frechmann, and Theresa G. Depret, both of 9804 E. 25th St. Terrace, Independence, Mo. 64052

Filed Apr. 14, 1975, Ser. No. 567,743

Int. Cl.² A42B *5/00*

U.S. Cl. 2—207 **5 Claims**

1. An article of wearing apparel comprising:

a. an elongated fabric member having an intermediate portion and opposite end portions, said fabric member having opposed side edges;

b. first and second facing fabric layers, a pair of fabric layers extending between a respective one of the opposite end portions and the intermediate portion of said fabric and connected at spaced points to define a passage, said pair of fabric layers each having opposed side edges having a spacing therebetween less than a spacing between the opposite side edges of said fabric member whereby when the other of the end portions of said fabric member have been moved through the passage adjacent the said end portion for use, said fabric portions provide resistance to pulling of said other end portion through said passage; and

c. a fabric panel having an end edge and a side edge, said fabric panel side edge being joined to said fabric member at one of said side edges thereof in a manner such that said fabric panel and the intermediate portion of said fabric member define a hood.

3,935,598

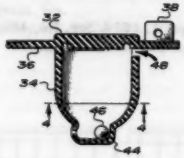
FLAPPER FLUSH VALVE

Albert Leo Schmidt, 1000 W. Eva Lane, Mount Prospect, Ill. 60070

Filed July 8, 1974, Ser. No. 486,364

Int. Cl.² E03D *1/34*

U.S. Cl. 4—57 P **11 Claims**



1. A flapper valve for use in a tank having a valve operating mechanism and a flapper valve sealable outlet fitting for the liquid in the tank, said flapper valve comprising

an attachment portion means for connecting the flapper valve to the tank structure in a position that the valve will function,

a buoyant closure portion means for selectively closing said tank outlet, said closure portion means comprising

a capped sealing area for engaging said tank outlet fitting,

a vented buoyant hollow float bulb having a liquid inlet opening, said float bulb means depending downwardly from said closure portion and interior of said sealing area, and

a valve actuating tab for connecting said valve to said valve operating mechanism,

an intermediate hinge portion means comprising flexible hinge arm means connected between said attachment portion means and said closure portion means, and

ball check valve means connected to said float bulb means having an operator selectable ball position from outside said tank through use of said valve operating mechanism connected to said valve actuating tab whereby the venting of air from said float bulb is selectively controlled.

3,935,599

MOVABLE SWIMMING POOL BULKHEAD

Robert Stark, 735 NE. 198th, Seattle, Wash. 98155

Division of Ser. No. 366,627, June 4, 1973, Pat. No. 3,842,484. This application July 31, 1974, Ser. No. 493,471

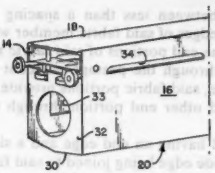
Int. Cl.² E04H *3/18*

U.S. Cl. 4—172 **4 Claims**

1. A movable, submersible bulkhead for a swimming pool, comprising:

an elongated hollow body having top, bottom, end and side walls formed of fiberglass and resin, and a platform be-

tween the top and bottom walls and joining the side walls, openings in said end walls for providing ingress of water into the body, slots in the side walls at the water level for dampening wave action of the water, said side walls of said body including cores of balsa wood for rigidifying the



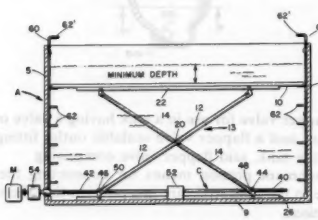
body and providing partial flotation, and means for supporting and aligning the body within the pool including a pair of transversely spaced rollers on each end of the body for engaging the pool for carrying the weight of the body and preventing rotation of said body when the same is moved laterally along the pool.

3,935,600

SWIMMING POOL

William N. Scribner, 1237 Linworth Ave., Baltimore, Md. 21212

Filed Apr. 1, 1974, Ser. No. 456,613
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172.13 **1 Claim**



1. A swimming pool having a liquid tight permanent bottom and side walls and a horizontal auxiliary vertically adjustable bottom positioned above the permanent bottom, having means for raising and lowering the said auxiliary bottom relative to the permanent bottom, comprising;

a. the auxiliary bottom being of a size slightly less in dimension than the permanent bottom to enable the auxiliary bottom to be moved vertically within and adjacent the inner surface of the side walls of the pool;

b. the means for raising and lowering the auxiliary bottom comprising a pair of elongated vertically arranged hinge supports positioned at two opposite sides of the pool, one pair of supports positioned one at each side of the pool and between the auxiliary bottom and the permanent bottom;

c. each pair of supports being hinged at a point adjacent their centers;

d. roller means fixed to the lower and upper ends of each of the hinged supports;

e. a pair of tracks positioned over and along the under surface of the auxiliary bottom and over the upper surface of the permanent bottom extending in a plane with the hinged supports for receiving the said rollers, the length of the tracks being substantially the length of the under surface of the auxiliary bottom;

f. means for moving the rollers along the tracks comprising a pair of threaded blocks connected to the lower ends of each of the hinged supports, including a shaft extending substantially the full length of the pool in a plane parallel with the hinged supports, having right and left hand threads on its opposite ends for threadedly engaging one of the said blocks at each end of the shaft.

g. means positioned outside the pool for rotating the shaft in either direction;

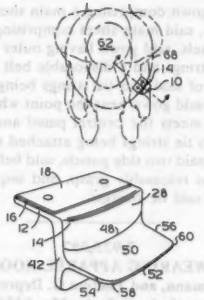
h. perpendicular stationary locking means spaced over the edge of the pool for fixing the selected positions of the auxiliary bottom, said stationary locking means having projections extending horizontally therefrom for engaging the underside of the auxiliary bottom, side stationary locking means being rotatable in a horizontal plane to an angle of at least 45° for moving the horizontal projections in and out of engaging position with the auxiliary bottom for locking the same in position when in one position and out of locking position when in another position.

3,935,601

SANITARY TOILET SEAT RING LIFT

Milton A. S. Hermann, 1355 N. Sandburg Terrace, Apt. 9020, Chicago, Ill. 60610

Filed Dec. 23, 1974, Ser. No. 535,275
Int. Cl.² A47K *13/10*
U.S. Cl. 4—251 **20 Claims**



1. A lift for a toilet seat ring pivoted to a toilet bowl and having an under surface spaced above the top of the bowl, comprising:

a base to be secured to the under surface of the toilet ring with an outer edge adjacent the outer edge of the ring;

a shield depending from the outer edge of the base to span the gap between the under surface of the ring and the top of the bowl; and

a handle extending outwardly from the shield with a manually engageable under surface for lifting the toilet seat.

3,935,602

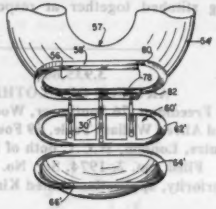
TRAPS FOR SINKS, LAUNDRY TUBS AND THE LIKE

Howard D. Kale, 4621 Gulf of Mexico Drive, Longboat Key, Fla. 33548

Filed Aug. 19, 1974, Ser. No. 498,291
Int. Cl.² E03C *1/26, 1/264*
U.S. Cl. 4—292 **7 Claims**

1. In a trap unit for use in connection with sinks, laundry tubs and the like, said trap unit comprising a conduit having a dip portion with an opening faced adjacent thereto, and a bottom closure member for closing said opening, a blocking member comprising a horizontal rim and transversely extending horizontal cross-members and a plurality of vertically

spaced fingers on said horizontal cross-members, said blocking member positioned so that the rim thereof rests horizontally on said closure member and is positioned between the



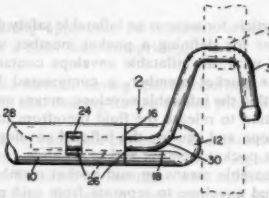
closure member and the dip portion of the conduit with said vertically spaced fingers extending into the dip portion of the conduit, and means for detachably securing said bottom closure member to said dip portion of said conduit.

3,935,603

ADJUSTABLE HANGER HANDLE FOR A CRIB FRAME

Robert G. Bryant, Gardner, Mass., assignor to GEM Industries, Inc., Gardner, Mass.

Filed Mar. 31, 1975, Ser. No. 563,851
Int. Cl.² A47C 31/00
U.S. Cl. 5—11 **1 Claim**



1. Supporting means for a spring frame of tubing in rectangular shape, said means comprising

a hanger having an elongated shank at one end and a hook at the opposite end,

and indented means in a portion of said tubing receiving said elongated shank slidably adjustable therein whereby the hanger is slidably adjustable laterally with respect to the spring frame,

said indented means comprises a portion of the tubing which is indented oppositely to the general circumference of the tubing and forms a semicylindrical supporting member opposite to an unindented portion of the tubing adjacent thereto,

a second indented means spaced from the first indented means along the length of the tubing, said two indented means together forming a two-point sliding support for the elongated shank of the hanger.

3,935,604

SUPPORT DEVICE FOR LIFTING AND SUPPORTING PATIENTS

Robert A. Collins, 10632 Baton Rouge Place, Northridge, Calif. 91324

Filed June 10, 1974, Ser. No. 477,767
Int. Cl.² A61G 7/02
U.S. Cl. 5—90 **14 Claims**

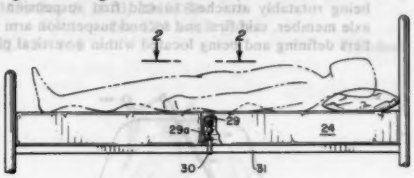
1. A support device located on the bed of a patient for elevating patient for use of a bedpan comprising:

a flat flexible non-elastic base sheet resting on the bed;

tie means extending from opposite sides of said base sheet and connected with said bed for securing said base sheet;

at least a pair of cushions extending longitudinally of said base sheet, lengthwise of said bed;

means for securing each cushion to said base sheet at a longitudinal edge of each cushion;



the spacing between adjacent inside longitudinal edges of said two cushions when inflated being great enough to receive a bedpan therebetween; and

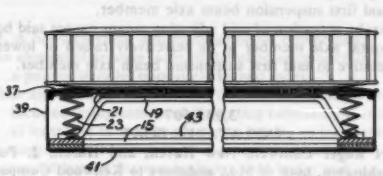
means for individually inflating and deflating said pair of cushions.

3,935,605

MATTRESS FOUNDATION

Ronald G. Hutchinson, Naperville, Ill., assignor to Simmons Company, Atlanta, Ga.

Filed Dec. 16, 1974, Ser. No. 532,879
Int. Cl.² A47C 23/04
U.S. Cl. 5—351 **12 Claims**



1. A foundation in the nature of a bed spring for use beneath a mattress to support the same, comprising

a base providing at least a rigid lower periphery for supporting the foundation and

structure rising from said base to provide an elevated supporting platform substantially coextensive with the mattress to be supported,

said platform having a stable central area which is substantially rigid and unyielding under normal loads imposed upon a bed spring,

the area of said platform between said central area and at least the side edges of the foundation being resiliently deflectable under concentrated vertical load, and having an extent laterally of the foundation sufficient to cushion the concentrated load of a person seated on the side edge of a mattress supported by the foundation.

3,935,606

RETRACTABLE SUSPENSION SYSTEM

Olaf Soot, 9 Tomahawk Lane, Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 379,234, July 16, 1973, abandoned. This application Apr. 5, 1974, Ser. No. 458,209
Int. Cl.² B63C 13/00
U.S. Cl. 9—1 T **6 Claims**

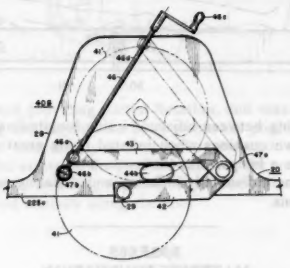
1. A retractable suspension system comprising:

a first nonrotatable horizontal suspension beam axle member,

a movable horizontal axle member which is parallel to said first suspension beam axle member,

a first suspension arm member, the first end thereof being fixedly attached to one end of said horizontal axle member and the second end thereof being rotatably attached to said first suspension beam axle member, said horizontal axle member being attached only at said one end and being perpendicular to said first suspension arm member,

a second suspension arm member, the first end thereof also being rotatably attached to said first suspension beam axle member, said first and second suspension arm members defining and being located within a vertical plane,



spring means interconnecting said first and second suspension arm members, said spring means being located directly above said first suspension arm member and directly below said second suspension arm member, and

means attached to said second suspension arm member for adjusting the rotational orientation thereof relative to said first suspension beam axle member,

whereby actuation of said adjusting means causes said horizontal axle member to be selectively raised or lowered relative to said first suspension beam axle member.

3,935,607

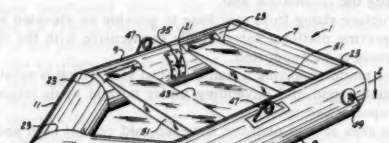
INFLATABLE BOAT

Robert Roger Cantwell, New Haven, and Harold J. Pohl, Washington, both of Mo., assignors to Kellwood Company, St. Louis, Mo.

Filed Aug. 26, 1974, Ser. No. 500,320

Int. Cl.² B63B 7/08

U.S. Cl. 9—2 A **4 Claims**



1. An inflatable boat comprising an outer tube having a stern section, side sections extending forward from opposite ends of the stern section at opposite sides of the boat, and bow sections angled toward one another from the forward ends of the side sections and meeting generally in the fore-to-aft central plane of the boat, and a plurality of inner inflatable tubes arranged end-to-end in said outer tube, each inner tube comprising a straight length of air-impervious flexible sheet material formed into a tube with its longitudinal margins brought together and sealed to form a longitudinal seam, and its ends sealed together to form end seams, each inner tube extending through a plurality of said sections, each inner tube having an inflation valve and said outer tube having openings for said inflation valves, and each inner tube being removable, when deflated, from the outer tube through the respective opening, the stern section, each side section and each half of the bow section of the outer tube each comprising a separate tubular section of said outer tube material, said separate tubular sections being stitched together at respective abutting ends thereof.

3,935,608

ARTICLE OF CLOTHING

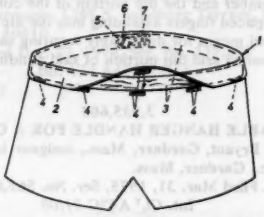
Raymonde Freedman, 76 Southover, Woodside Park, London, N.12, and Alfred William Teale, 69 Foundling Court, Brunswick Centre, London, W.C.1, both of England

Filed Jan. 2, 1974, Ser. No. 430,039

Claims priority, application United Kingdom, Apr. 3, 1973, 15941/73

Int. Cl.² B63C 9/08

U.S. Cl. 9—319 **7 Claims**



1. An article for wear as an inflatable safety device comprising, means for defining a pocket member wearable as an article of wear, an inflatable envelope contained uninflated within the pocket member, a compressed fluid container wholly within the inflatable envelope, means on said container for actuation to release the fluid therefrom thereby inflating the envelope and causing the inflated envelope to be forced out of the pocket member and to separate completely therefrom, releasable means on said pocket member for allowing the inflated envelope to separate from said pocket member upon inflation thereof, and wherein in use said envelope encircles the body of a wearer, whereby on release it travels up under the arms of the wearer.

3,935,609

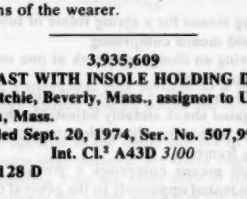
SHOE LAST WITH INSOLE HOLDING DEVICES

Walter J. Brotchie, Beverly, Mass., assignor to USM Corporation, Boston, Mass.

Filed Sept. 20, 1974, Ser. No. 507,999

Int. Cl.² A43D 3/00

U.S. Cl. 12—128 D **5 Claims**



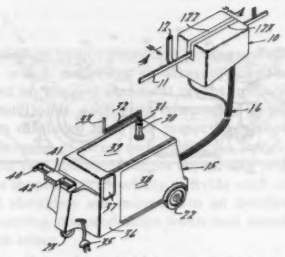
1. A shoe last having an insole securing member comprising at least one elongated blade projecting substantially normally from the bottom of the last and adapted to cut into and be embedded in an insole forceably applied to the last bottom, said blade having at least one end undercut to form a projection which resists dislodging of the insole.

3,935,610

CLEANING APPARATUS FOR OVERHEAD RAILS

Norman H. Vogt, 457 Fisher Court, Clawson, Mich. 48017

Filed July 1, 1974, Ser. No. 484,939
Int. Cl.² E01H 8/00
U.S. Cl. 15—21 R 7 Claims



1. Rail scrubbing apparatus for cleaning a rail having a hanger side and a clear side, comprising,

a traveler,

a frame in said traveler having spaced bearings,

an axle in each said bearing having an end projecting therefrom,

a trolley wheel on each said projecting end of each said axle cantilevered relative to said bearings allowing said trolley wheels to be mounted on and taken off a rail from the one clear side of the rail and to travel along a rail without obstruction from hangers on the opposite side of a rail;

a travel motor mounted on said frame connected to one said axle and trolley wheel to rotate said trolley wheel to move said frame along a rail,

a first brush,

first means rotationally mounting said first brush on said frame for scrubbing the clear side of a rail including a first brush motor connected to said first brush to rotate said first brush relative to the clear side of a rail,

a swing case pivoted on said frame on the hanger side of a rail,

a second brush,

second means rotatably mounting said second brush on said swing case including a second brush motor connected to said second brush for rotating said second brush relative to the hanger side of a rail, and

hanger contact-walk-over means on said swing case to intercept hangers on the hanger side of a rail and to swing said case and second brush sidewise outwardly from a rail at hangers to permit said second brush to by-pass hangers;

pivot mounting means swingably mounting said first brush, said first brush mounting means, and said first brush motor to move them sidewise outwardly from the clear side of a rail,

a first bell-crank arm on said pivot means,

a second bell-crank arm on said swing case, and

actuator means on said frame for moving said bell-cranks to pivot said pivot mounting means and said swing case to move their respective brushes sidewise outwardly of a rail to eliminate interference by said brushes in mounting and dismounting said traveler on a rail.

3,935,611

BRUSH FOR THE CARE AND CLEANING OF THINGS AND THE BODY

Lorenz Locher, Kirchplatz 6, 7932 Munderkingen, Danube, Germany

Filed Mar. 1, 1974, Ser. No. 447,319
Claims priority, application Germany, Mar. 13, 1973, 2312318; Oct. 3, 1973, 2349580
Int. Cl.² A46D 9/02
U.S. Cl. 15—160 7 Claims

2. A body-cleaning and massage brush comprising:

an elongated arcuate body of flattened cross-section having a pair of parallel oppositely turned faces;

first and second brush means of different textures on said faces covering same and projecting outwardly therefrom, at least one of said brush means having at least one concave contour and at least one convex contour;

a curved handle for manipulating said body; and

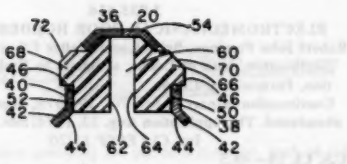
means for mounting said handle on one end of said body in a position in which said brush has a generally S-shaped configuration.

3,935,612

WINDSHIELD WIPER BLADE

Robert O. Wittwer, Portage, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Oct. 17, 1974, Ser. No. 515,637
Int. Cl.² B60S 1/04
U.S. Cl. 15—250.42 6 Claims



4. A wiper assembly having a wiper blade, a pressure-distributing superstructure operatively connected with said wiper blade, said superstructure having at least two parts pivotally connected together, the first of said parts having end portions with spaced apart side walls, a pair of aligned openings in the side walls of said end portions, the second part having a mid-portion with a vertical open space extending from top to bottom between a pair of side walls thereof, a pair of outwardly projecting lugs formed on the said side walls of said

midportion, said lugs pivotally seating in said openings in the first part.

3,935,613

DETACHABLE LUGGAGE CASTER ROLLER UNIT

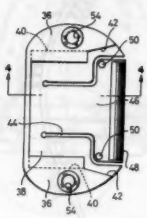
Katsuyoshi Kaneko, Tokyo, Japan, assignor to Maruwa Echo Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,666

Claims priority, application Japan, Oct. 26, 1974, 49-129805

Int. Cl.² B60B *33/00*

U.S. Cl. 16—30 **3 Claims**



1. A detachable luggage caster roller unit comprising in combination: a seat member adapted to be secured to an end surface of a piece of luggage, said seat member including a bottom wall, upstanding side walls and a rear wall connected between said side walls, said side walls and said bottom wall being formed to define a pair of opposed forwardly extending lateral grooves closed at a location adjacent said rear wall and open at their forward ends, a pair of symmetrical slits being formed in said bottom wall extending from the region of said rear wall forwardly thereof to thereby define a resilient tongue, the free forward edge of said tongue being provided with a raised portion extending parallel to said rear wall, said bottom wall, rear wall, side walls and raised portion of said tongue defining a flat-bottomed substantially rectangular cavity therewithin, said tongue being pivotable about the fixed end portion thereof so as to facilitate reception of the base plate of a caster roller assembly within said cavity upon depression of the free edge of said tongue and lock said base plate within said cavity upon the release of said free edge of the tongue; and a caster roller assembly including a susstantially rectangular base plate dimensioned to be positioned within said cavity with a pair of opposed side edges thereof retained within said lateral grooves, a roller support bracket carried rotatably by said base plate, and a roller mounted rotatably in said roller support bracket whereby said roller is enabled to freely swivel about said bracket.

3,935,614

ELECTROMECHANICAL DOOR HOLDER-CLOSER

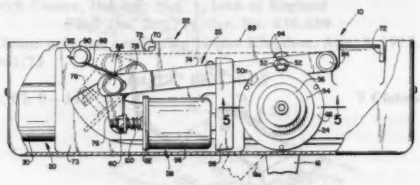
Robert John Pannone, Bristol, and Walter Edward Surko, Jr., Southington, both of Conn., assignors to Emhart Corporation, Farmington, Conn.

Continuation-in-part of Ser. No. 293,079, Sept. 28, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 499,908

Int. Cl.² E05F *15/20*

U.S. Cl. 16—48.5 **50 Claims**

1. A holder-closer for a door member mounted for pivotal movement between open and closed positions relative to a frame member and comprising a casing for mounting in fixed position relative to one of the members, a spindle journalled in said casing for axial rotation in one and an opposite direction relative thereto and projecting therefrom, resilient means yieldably resisting rotation of said spindle in said one direction, dampening means contained in said casing for yieldably resisting rotation of said spindle in said opposite direction in response to reactive torque applied to said spindle by said resilient means to control the closing speed of the door, arm means connected to said spindle externally of said casing for connection to the other of the members to rotate said spindle in said one direction when the door is opened, a clutch, means for coupling one part of said clutch to said spindle externally of said casing for rotation with said spindle in said one and said opposite direction, latching means supported for movement relative to said casing between latching and releasing position and engaging another part of said clutch in said latching position to retain said other part against rotation relative to said



casing, said one part being rotatable in said one direction with said spindle and arm means and relative to said other part when said latching means is in its latching position and the door is opened to a hold-open position, said other part cooperating with said one part to restrain said one part against rotation in said opposite direction in response to said reactive torque while said door is in its hold-open position and said latching means is in its latching position, and electrically operated holding means for releasably retaining said latching means in its latching position.

3,935,615

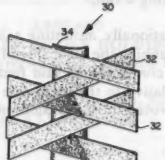
JOINT FORMING TAPE FOR A COLLAPSIBLE CYLINDRICAL CONTAINER

Alfred W. Wakeman, Madison Rd., Durham, Conn. 06422

Filed July 19, 1973, Ser. No. 380,589

Int. Cl.² E05D *7/00*; B65D *5/36*

U.S. Cl. 16—150 **7 Claims**



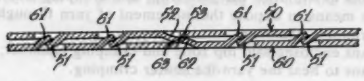
1. An elongated joint-forming structure for interconnecting contiguous panel members having mating edges, said structure comprising a series of connector members each running crosswise of the joint to be formed and disposed in spaced relation therealong, at least some of said cross members intersecting and crossing other of said members in alternation along the joint to form an X-like configuration, and carrier means comprising at least one longitudinal member from which each of said cross members is supported in said X-like configuration with the ends of said cross members extending marginally outwardly of said carrier means, and means on either said cross members or carrier means securing them together to form said structure.

3,935,616

SEALLESS STRAP CONNECTION MEANS

Larry J. Simmons, Northbrook, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jan. 24, 1975, Ser. No. 543,999
Int. Cl.² B65D 63/02
U.S. Cl. 24—20 EE 8 Claims



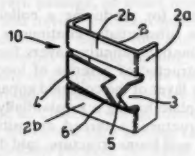
1. A sealless strap connection between overlapped lengths of strap which comprises an array of longitudinally spaced joints and an integral abutment means positioned between a pair of said joints, each joint comprising lengthwise opposed shoulders displaced from the respective planes of said overlapped lengths of strap and shaped to interlock with each other, and said abutment means comprising juxtaposed protuberances shaped to irreversibly override each other while said opposed shoulders are moved into an interlocking position and presenting opposed stops when said shoulders interlock with each other.

3,935,617

FASTENING DEVICES

Leslie Gordon Hudson, Little Copped Hall, Epping, Essex, England

Filed Aug. 13, 1974, Ser. No. 496,986
Claims priority, application United Kingdom, Aug. 15, 1973, 38584/73
Int. Cl.² A44B 21/00; E04B 5/52
U.S. Cl. 24—81 B 3 Claims



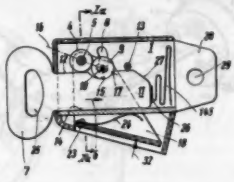
1. A releasable fastening device for supporting a member, such as a display panel, comprising body means which has seating means defined by first and second arm means each of which protrudes from the body means, said arm means being directed away from said body means towards one another and terminating spaced from one another thereby defining therebetween a gap in which said display panel can be received, said first arm means defining a lateral stop for said display panel and said second arm means being resiliently mounted on said body means whereby said second arm means can move towards and away from said body means so that when a display panel enters said gap said second arm means can engage said display panel and whereby said display panel can be released by resiliently urging said second arm means towards said body means so that the said second arm means is disengaged from said panel, said body means being of a generally channel-shaped cross section and including a pair of end portions and a center portion which extends between and integrally connects said end portions, said center portion being defined by a pair of substantially parallel striplike bridging portions which extend between the end portions and are disposed adjacent the opposite edges of said body means, said center portion having a space located between said bridging portions said first arm means being integrally connected to one of said end portions and projecting outwardly from said bridging portions said second arm means being integrally connected to the other of said end portions and projecting outwardly from said bridging portions, said first and second arm means projecting generally toward one another and being substantially aligned with the space between said bridging portions.

3,935,618

CLOSURE FOR SAFETY BELTS

Artur Föhl, Scheimenwasenstr. 68, 7061 Haubersbronn, Germany

Filed June 17, 1974, Ser. No. 480,029
Claims priority, application Germany, June 20, 1973, 7322931[U]
Int. Cl.² A44B 11/26
U.S. Cl. 24—230 AL 8 Claims



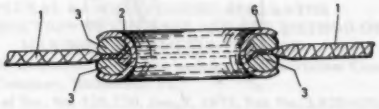
1. A releasable latch, especially for passenger seat belts, comprising in combination; a housing having a slot, a member having a tongue insertable into the slot in the housing, notch means in the tongue substantially perpendicular thereto, roller bodies in the housing engageable with said notch means when the tongue is inserted into said slot to latch the said housing and the said member together, said roller bodies extending laterally to the length of the tongue and disposed for rolling engagement of the roller bodies with the tongue upon insertion of the tongue into the slot, said roller bodies rollingly engaging and lying in the path of said notch means, resilient means biasing said roller bodies in notch means engaging direction, and means for moving at least one of the said roller bodies for release thereof under rolling friction movement during initial opening against the bias of said resilient means in the direction of disengagement from said notch means and in direction transversely thereof.

3,935,619

GRUMMENT FOR SAIL CLOTH

Douwe Gaastra, Heeg, Netherlands, assignor to Gaastra B.V., Sneek, Netherlands

Division of Ser. No. 351,481, April 16, 1973, Pat. No. 3,890,695. This application Mar. 31, 1975, Ser. No. 563,312
Int. Cl.² A43C 5/00; B63H 9/08
U.S. Cl. 24—141 3 Claims



1. A grummet assembly for use in a material, such as sail cloth or the like, comprising

there being an opening in said material, the edge of said opening being ravelled and having a thermosetting adhesive smeared thereon;

a first ring having an inner diameter substantially the same as said opening in contact with one side of said material at the edge of said opening;

a second ring having an inner diameter substantially the same as said opening in contact with the other side of said material at the edge of said opening;

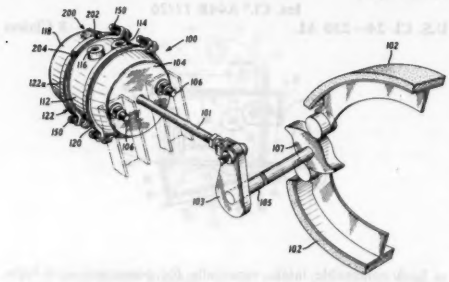
a torus-shaped collar enclosing said rings and the edge of said opening so as to tightly clamp said edge between said rings.

3,935,620

CLAMP BAND RETENTION APPARATUS FOR A PARKING BRAKE CHAMBER

Michael L. Carton, Chesterfield, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Apr. 3, 1975, Ser. No. 564,889
Int. Cl.² F01B 7/00; B60T 13/00; B65D 63/06
U.S. Cl. 24—279 9 Claims



1. Apparatus for preventing accidental explosive separation of a first heavy spring loaded section of a spring set safety brake chamber from a second adjacent section of the chamber comprising:

a. a clamp band circumferentially extending about an interface between the adjacent sections, the band radially outwardly extendable from the interface; and

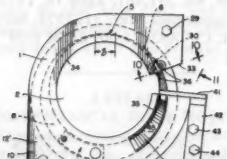
b. means fixedly attached to the brake chamber adjacent the interface for restrictively engaging the clamp band to limit radial outward extension of the band.

3,935,621

STUFFER CRIMPING APPARATUS

Bernd Weber, Obernau, Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jan. 14, 1974, Ser. No. 432,838
Claims priority, application Germany, Jan. 18, 1975, 2302363
Int. Cl.² D02G 1/12, 1/14
U.S. Cl. 28—1.6 10 Claims



1. A stuffer crimping apparatus for crimping a synthetic thermoplastic yarn, said apparatus comprising:

an outer rotatable hollow wheel having an inner circular rolling surface:

an inner rotatable wheel having an outer rolling surface of smaller diameter than the inner diameter of the circular rolling surface of said outer wheel, the axis of rotation of said inner wheel being eccentric to the axis of rotation of said outer wheel, means to press the rolling surfaces of the two wheels toward each other to form a nip zone for rolling engagement with said yarn fed therebetween;

means to rotate each wheel in the same direction and at the same peripheral speed of said rolling surfaces;

flange means on one side of said outer hollow wheel forming a yarn feed chamber between the two rolling surfaces at the entry to said nip zone and also forming a yarn crimping chamber between the two rolling surfaces at the exit from said nip zone;

means to introduce the yarn into said feed chamber;

means to withdraw the yarn from said crimping chamber;

gate means to oppose the movement of yarn through said crimping chamber;

means enclosng said nip zone and crimping chamber; and

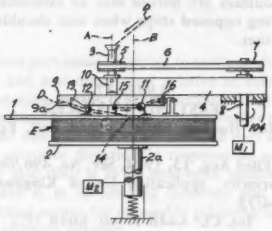
means to heat the yarn for stuffer crimping.

3,935,622

APPARATUS FOR PRODUCING A COILED THREAD PACKAGE

Renato Crotti, 71, Corso Canalgrande, Modena, Italy (41100)

Filed Jan. 28, 1974, Ser. No. 436,981
Int. Cl.² B65H 51/02
U.S. Cl. 28—21 10 Claims



1. An apparatus for producing a coiled thread package constructed of a substantially continuous length of thread disposed in substantially annular layers forming a coil, each layer being constructed of a series of loops which progress along the annular layer of the coil, said apparatus comprising:

a. a receiving plate having a substantially vertical axis;

b. a frame structure, a thread depositing disc rotatably mounted on said frame structure, said disc being arranged so as to face said receiving plate and having a substantially vertical axis, said axis of said depositing disc being arranged eccentrically with respect to the axis of the receiving plate, said receiving plate and said depositing disc being capable of relative movement toward and away from each other in vertical direction;

c. means for yieldingly urging the said receiving plate and the said depositing disc into relative movement towards each other;

d. means for rotating the said depositing disc around its axis;

e. further means for causing a relative movement between the axis of the depositing disc and the receiving plate;

f. a through bore on the said depositing disc providing a passage for the thread to be deposited on the receiving plate;

g. a feeding device for the thread to be deposited on the receiving plate, said feeding device comprising:

1. inlet thread guiding means arranged co-axially with respect to the vertical axis of the said depositing disc;

2. draw-off thread guiding means integral in rotation with the depositing disc;

3. a thread take-up member fixedly secured to the frame structure which supports the depositing disc and arranged on the side of the said depositing disc which is opposite to the side which faces the receiving plate, said take-up member being stationary with respect to the rotational movement of the depositing disc and presenting an annular outer friction surface which is coaxial to the vertical axis of the depositing plate,

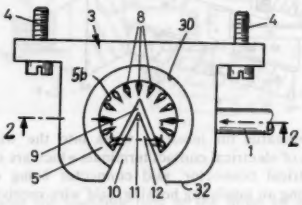
whereby the thread coming from a suitable supply is guided by the said inlet thread guiding means to the said draw-off thread guiding means so as to be laid, on at least an arc of a circumference, onto said annular friction surface in a direction which is contrary to the direction of rotation of the depositing disc, passing from the said friction surface, to the said bore in the depositing disc, so as to be deposited on the said receiving plate upon rotation of the depositing disc, and relative movement between the axis of the depositing disc and the receiving plate.

3,935,623

YARN SINGEING BURNER CONSTRUCTION

Hermann Mettler, Arth, Switzerland, assignor to Aktiengesellschaft Fr. Mettler's Söhne Maschinenfabrik, Switzerland

Filed Dec. 30, 1974, Ser. No. 537,326
Claims priority, application Switzerland, Jan. 17, 1974, 646/74; Aug. 20, 1974, 11355/74
Int. Cl.² D02J *13/00, 3/16*
U.S. Cl. 28—63 9 Claims



1. A yarn singeing burner, comprising a housing having a yarn passage therethrough and a wall having an entrance opening into said yarn passage, an insert member disposed in said yarn passage and having a portion spaced inwardly from said housing and defining a burner fuel and air chamber between said insert member and said housing, said insert member having a plurality of apertures for the passage of singeing flame jets therethrough, means for supplying fuel and air to said burner fuel and air chamber for ignition therein to generate singeing flame jets, and a yarn guiding channel extending through said yarn passage between the flame jets and the yarn and having an open side opening to the entrance for the passage of the yarn therethrough.

3,935,624

CUTTER TOOL FOR USE IN A BORING HEAD

Siegfried Weinreich, Bierden, Germany, assignor to Firma Gebruder Heller, Bierden, Germany

Division of Ser. No. 463,805, April 24, 1974, Pat. No. 3,861,010. This application Oct. 29, 1974, Ser. No. 518,526
Claims priority, application Germany, Apr. 25, 1973, 2320876. The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl.² B26D *1/00*
U.S. Cl. 29—95 R 1 Claim

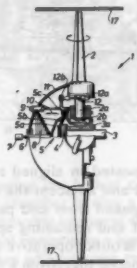
1. A cutter tool for use in a boring head, said cutter tool being developed as a plate having two faces and six end surfaces, one face of said plate having the form of an irregular hexagon the six sides of which form sections of the three sides of a first equilateral triangle and sections of the three sides of a second equilateral triangle, said triangles being superposed on each other and angularly offset with respect to each other around an acute angle, said sections of said first triangle being developed as primary edges and said sections of said second triangle being developed as secondary edges, said end surfaces bordered by said primary edges being rake and planar, and said end surfaces bordered by said secondary edges being rounded chamfers.

3,935,625

METHOD OF MANUFACTURING AXIAL FANS OF DIFFERENT SIZES

Edgar Saterdal, Rottne, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Continuation of Ser. No. 238,559, March 27, 1972, now Pat. No. 3,844,680. This application July 18, 1974, Ser. No. 489,734
Claims priority, application Sweden, Mar. 30, 1971, 4133/71
Int. Cl.² B23P *15/00*
U.S. Cl. 29—156.8 R 3 Claims



1. A method for manufacturing an axial-flow fan having a size selected from a series of a limited number of standard sizes, said fan having a given number of blades which are adjustable as to pitch, the method comprising the steps of supplying a single hub structure having a dog member mounted thereon for axial displacement relative thereto, and means for mounting blades at a given number of connection points around the periphery of the hub; supplying a like number of identical blades adapted to be mounted at said connection points for rotation about a radial axis; supplying means for connecting each of said blades to said dog member to effect rotation of said blades on their axes upon axial displacement of said dog member on the hub axis, providing a limited number of different standard size axles, grouping said axles in one set of axles for each one of said limited number of standard sizes, each set including a number of equal length axles corresponding to said given number of blades, and manufacturing said fan in said selected size by selecting the set of axles corresponding to the desired size and using said set of axles to mount the blades on said hub, by mounting the inner end of each of said axles at one of said connection points and rotatably mounting a blade on the outer end of each of said axles with a single axial-thrust rolling bearing, and positioning said bearing to receive the outward thrust caused by the rotation of the hub structure and centering the bearing by means of a chamfered support ring.

3,935,626

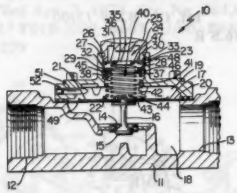
PLURAL RANGE PRESSURE REGULATOR CONSTRUCTION OR THE LIKE AND THE METHOD OF MAKING THE SAME OR THE LIKE

Francis S. Genbauff, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 320,520, Jan. 2, 1973, Pat. No. 3,825,029. This application May 16, 1974, Ser. No. 470,434
Int. Cl.² B23P *15/00;* F16K *31/12*
U.S. Cl. 29—157.1 R 5 Claims

1. A method for making a plural range biasing construction comprising the steps of providing a housing means having a movable part, disposing biasing means in said housing means for acting on one side of said part to tend to move said part in one direction relative to said housing means, said biasing means comprising a plurality of separate spring means, causing each spring means to act on said part to provide one biasing range for said construction, storing one of said spring means completely in a storage space of said housing means so

that the same will not act on said part whereby the remaining spring means acting on said part will provide another biasing range for said construction, forming said one spring means and said remaining spring means from coiled compression springs, causing said springs to be concentrically disposed and each having one end thereof operatively engaging said part when acting on said part to provide said one biasing range for said construction, and forming said storage space for said one



spring means to be located in aligned relation with said remaining spring means and adjacent the other end thereof so as to be completely spaced from said part a distance at least equal to the length of said remaining spring means whereby said one spring means is out of operative engagement with said part and completely spaced therefrom a distance at least equal to the length of said remaining spring means when said other biasing range is being provided.

3,935,627

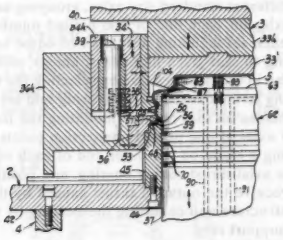
METHOD OF MAKING SHEET METAL PULLEY

Fred A. Wolbert, Northfield, Ohio, assignor to Arrowhead Engineering Corporation, Knox, Ind.

Division of Ser. No. 224,778, Feb. 9, 1972, Pat. No. 3,837,200. This application July 19, 1974, Ser. No. 489,992

Int. Cl.[2] B21K 1/42

U.S. Cl. 29—159 R **16 Claims**



1. A process for making a sheet metal pulley having plural grooves therein in a continuous single work cycle from a hollow generally cup-shaped sheet metal blank having an inner hub portion, an outer axially extending flange portion and at least one axially extending wall portion and at least one angular, transversely extending wall portion therebetween comprising the steps of:

a. supporting said blank in a metal deforming apparatus;

b. introducing a forming fluid into the interior of said blank to exert pressure against said wall portions;

c. exerting an axial force on said blank at said hub portion by actuating a ram member disposed thereat to outwardly deform said wall portions by the coaction of said axial force and said forming fluid;

d. confining and shaping said outwardly deformed wall portions between plural movable forming die members disposed exteriorly of said blank and cooperatively actuating said ram member and said plural forming die members to partially form grooves;

e. adjusting the pressure and volume of said forming fluid while simultaneously crimping at least one lateral wall of said grooves to complete the formation thereof; and

f. withdrawing said plural movable forming die member.

3,935,628

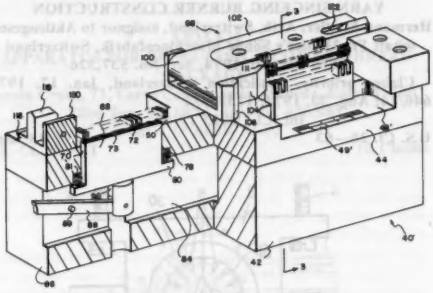
APPARATUS FOR INSERTING WIRES INTO TERMINALS IN AN ELECTRICAL CONNECTOR

John James Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 29, 1974, Ser. No. 528,524

Int. Cl.[2] H01R 43/04

U.S. Cl. 29—203 DT **3 Claims**



1. Apparatus for inserting wires into the wire-receiving portions of electrical contact terminals which are contained in an electrical connector, said connector being of the type comprising an insulating housing, said wire-receiving portions of said terminals being arranged in first and second rows, said rows extending in parallel spaced-apart relationship to each other, said apparatus comprising:

supporting means having first and second spaced-apart wire jig means thereon, said first wire jig means having means for holding a first predetermined plurality of wires in side-by-side spaced-apart parallel relationship with the distance between adjacent wires being the same as the distance between said adjacent terminals in said first rows, said second wire jig means having means for holding a second plurality of wires in side-by-side spaced-apart relationship with the distance between adjacent wires being the same as the distance between said adjacent terminals in said second row,

first and second wire inserting means on said supporting means adjacent to said first and second wire jig means respectively, each of said wire inserting means comprising a plurality of spaced-apart wire insertion punches extending normally with respect to said supporting means, each of said punches being in alignment with a wire disposed in said wire jig means,

a connector jig member for holding said connector, said connector jig member being pivotally mounted on an axis which extends mid-way between said first and second wire jig means and parallel to wires disposed in said wire jig means, said connector jig member having means for holding and locating said connector in a position in which said wire-receiving portions of said terminals are brought into alignment with wires in said first and second wire jig means when said connector jig member is moved along arcuate paths against said first and second wire jig means, and actuating means for moving each of said first and second wire inserting means relatively towards said connector jig member along a rectilinear path when said connector jig member is against said first and second wire inserting means respectively whereby,

upon locating wires in each of said first and second wire jig means, locating a connector in said connector jig member, moving said connector jig member against said first wire jig means, and then moving said first wire inserting means relatively along said rectilinear path, the wires in said first wire jig

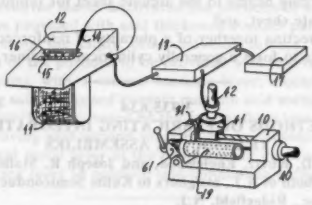
means are inserted into said terminals in said first row, and upon moving said connector jig member against said second wire jig means and similarly moving said second wire inserting means relatively along said rectilinear path, the wires in said second wire jig means are inserted into said terminals in said second row.

3,935,629

PIN INSERTION MACHINE FOR NEEDLE SELECTING CYLINDERS OF CIRCULAR KNITTING MACHINES

Mario Piro, Genoa-Pegli, Italy, assignor to Nuova San Giorgio S.p.A., Italy

Filed July 30, 1974, Ser. No. 493,143
Claims priority, application Italy, Aug. 9, 1973, 27713/73
Int. Cl.² B23P 19/04
U.S. Cl. 29—208 C 9 Claims



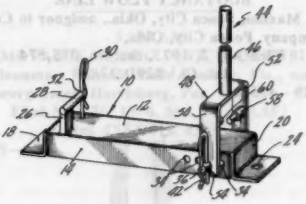
1. Apparatus for inserting pins in the holes of a needle selecting cylinder for a circular knitting machine which includes an electronic device having means for reading a pattern to be reproduced, said apparatus comprising a cylinder spindle having a spindle axis which is supported in a substantially horizontal position for horizontally supporting a needle selecting cylinder, means for rotating said cylinder spindle about said spindle axis, means for turning said spindle about a horizontal axis which is disposed perpendicular to said spindle axis, a support mechanism, means for moving said support mechanism in a direction substantially parallel to said spindle axis when said spindle axis is supported in said substantially horizontal position, a pin insertion mechanism carried by said support mechanism comprising a reciprocating pusher member and spring means for biasing said pusher member in a first direction, a control lever, a first portion of said control lever being connected to said pusher member, a second portion of said control lever including a cam follower, a control cam having a cam surface for engaging said cam follower, said control cam having a splined connection to a rotatably driven shaft and being connected to said support mechanism for movement therewith, said cam surface being operative on said cam follower and said control lever for allowing said pusher member to be driven in said first direction under the influence of said spring means and for thereafter driving said pusher member in a second direction against the bias of said spring means, means for feeding a pin into the path of said pusher as it is being driven in said first direction comprising means for supporting a plurality of pins in substantially parallel relationship and for permitting a pin to fall from said supporting means under the influence of gravity and into the path of said pusher, means for blocking movement of said pusher member in said second direction for disabling said pin insertion means, electromagnetic means for actuating said blocking means, a pin support extending beneath said needle selecting cylinder when said needle selecting cylinder is in a horizontal position for preventing inserted pins from falling from said needle selecting cylinder, said means for rotating said spindle, said means for moving said support mechanism and the means for controlling the movement of said pusher and said blocking means being controlled by signals from said electronic pattern reading device.

3,935,630

SHOCK ABSORBER SPRING CHANGING TOOL

Richard M. Roy, 31 Old Common Road, Wethersfield, Conn. 06109

Filed Apr. 28, 1975, Ser. No. 572,506
Int. Cl.² B23P 19/04
U.S. Cl. 29—227 16 Claims



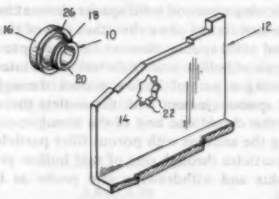
1. A tool for changing the helical coil spring of a shock absorber, said shock absorber having a removable keeper at one end and a nonremovable keeper at the other end retaining the coil spring, the tool comprising a base of generally rectangular plan form, means adjacent one end of the base for anchoring the nonremovable keeper end of the shock absorber when placed on said base, means adjacent the other end of and in the base for positioning shaft means proximate to said removable keeper, lever means adapted to be positioned over said shaft means and to be pivotable thereabout, and means integral with said lever means for compressing said coil spring as said lever means is rotated about said shaft so as to permit removal of said removable keeper and removal of said spring from said shock absorber.

3,935,631

METHOD OF SEATING A BEARING

Frank Doerner, 138 Aberdeen Road, Kitchener, Ontario, Canada

Filed Mar. 19, 1975, Ser. No. 559,912
Int. Cl.² B23P 11/00
U.S. Cl. 29—432.1 3 Claims



1. A method of seating a bearing in a support, said support containing therein a star-shaped hole, said bearing carrying on its periphery at least three rings of diminishing diameter, the diameter of the largest ring being greater than the diameter of said hole, the diameter of the second ring being marginally larger than the diameter of said hole, the diameter of the subsequent rings being smaller than the diameter of the hole, the largest ring being undercut marginally at the point of juncture with the bearing and the adjacent ring, comprising:

inserting the bearing into the hole commencing with its smallest ring until the diameter of the bearing containing the next ring to be inserted is the portion of the bearing carrying the ring having a marginally larger diameter than the diameter of the hole,

forcing said portion of the bearing having a marginally larger diameter than said hole through said hole whereby said ring having a marginally larger diameter than the

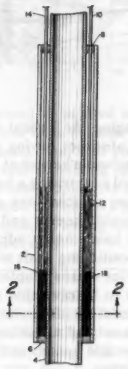
diameter of the hole is cut by said star-shaped hole in a corresponding star-shaped pattern and the shavings are collected in said undercut portion of said largest ring, whereby said bearing is seated securely in said hole.

3,935,632

METHOD OF PREPARING AN INSULATED NEGATIVE BUOYANCY FLOW LINE

Orwin G. Maxson, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed July 2, 1973, Ser. No. 375,574
Int. Cl.[2] B29D 27/04
U.S. Cl. 29—455 R 5 Claims



1. A method of preparing an insulated negative buoyancy flow line comprising:

a. positioning a section of jacket concentrically about a section of flow line to provide an annulus therebetween, the section of flow line extending beyond each end of the section of jacket;

b. positioning a first solid spacer element in the annulus at one end thereof to close one end of the annulus;

c. positioning a second solid spacer element in the other end of the annulus to close the other end of the annulus, said second solid spacer element being adapted for insertion of a pair of hollow probes therethrough into said annulus;

d. inserting a pair of hollow probes through said second solid spacer element with the outlets thereof positioned near the closed one end of the annulus;

e. filling the annulus with porous filler particles by injecting the particles through one of said hollow probes into said annulus and withdrawing said probe as the annulus is filled;

f. injecting a settable resin-forming composition through the other of said hollow probes into the annulus around the porous filler particles and withdrawing said other probe as the resin-forming composition is injected; and

g. allowing the resin forming composition to set.

3,935,633

TANK FABRICATION PROCESS

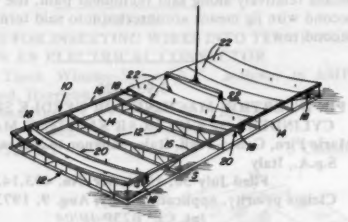
Jack E. Bunker, 108 E. Ash, Winfield, Iowa 52659

Filed Apr. 16, 1974, Ser. No. 461,456
Int. Cl.[2] B23Q 7/00
U.S. Cl. 29—559 2 Claims

1. A method for constructing a container comprising a skin formed of plates connected to each other in overlapping relation and having reinforcing beams, comprising the steps of:

a. placing a plurality of sheet strips in overlapping fashion on a jig having a semi-cylindrical concavity;

b. permitting the weight of the sheet strips to curve and conform the strips to the concavity and form an arcuate sheet;



c. attaching beams to the arcuate sheet for reinforcing the arcuate sheet; and

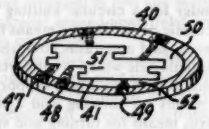
d. connecting together of a plurality of reinforced arcuate sheets to form a generally cylindrical container.

3,935,634

METHODS OF FABRICATING INTEGRATED TRANSDUCER ASSEMBLIES

Anthony D. Kurtz, Englewood, and Joseph R. Mallon, Wood Ridge, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Division of Ser. No. 393,804, Sept. 4, 1973, Pat. No. 3,873,956. This application Sept. 11, 1974, Ser. No. 504,859
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—577 9 Claims



1. A method of fabricating a transducer comprising the steps of:

a. growing a relatively thin layer of silicon dioxide on a wafer of silicon,

b. masking said silicon dioxide to provide a contact pattern,

c. depositing impurities according to said pattern to form ohmic contacts.

d. growing a thick layer of silicon dioxide over said pattern,

e. forming at least one piezoresistor on said wafer to cooperate with said contact pattern,

f. forming metal terminals coupled to said contact pattern,

g. metalizing a peripheral portion of said thick layer of silicon dioxide to form a surface to which any electrostatic glass bond can be made.

3,935,635

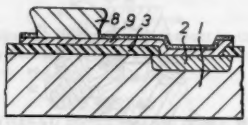
METHOD OF PRODUCING A SEMICONDUCTOR ARRANGEMENT

Leonhard Botzenhardt, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 22, 1974, Ser. No. 453,881
Claims priority, application Germany, Mar. 29, 1973, 2315710
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—578 10 Claims

1. A method for producing a semiconductor arrangement from a semiconductor body covered with an insulating layer provided with windows at desired points of connection to regions in the semiconductor body, said arrangement having conducting paths running on the insulating layer and contact-

ing the regions in the semiconductor body and the conducting paths at certain points being so reinforced by electrolytically deposited metal that the thickened contact parts resulting in this case are suitable for the wire-less contacting of the semiconductor arrangement, comprising: firstly applying a metal layer over said insulating layer provided with windows to cover said insulating layer and said windows; covering the portions of said metal layer corresponding to the desired positions of said conducting paths with a first masking layer,



which moveover leaves uncovered the portions of said metal layer to be provided with said thickened contact parts; thereafter covering the entire semiconductor surface, with the exception of the portions to be provided with said reinforced contact parts, with a second masking layer; electrolytically depositing said thickened contact parts on said metal layer at said portions left uncovered by the two masking layers; thereafter removing said second masking layer; subsequently removing said metal layer at the positions not covered by said first masking layer to produce said conducting paths.

3,935,636

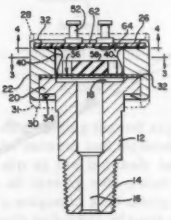
METHOD OF MAKING A PRESSURE TRANSDUCER

Seymour Mermelstein, Newton, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

Division of Ser. No. 456,122, March 29, 1974, Pat. No. 3,899,766. This application Mar. 25, 1975, Ser. No. 561,683

Int. Cl.² H01C *17/28*

U.S. Cl. 29—619 **4 Claims**



1. The method of making a pressure transducer comprising the steps of:

providing a hollow case which is open at its ends and has an internal flange disposed intermediate said ends,

inserting a diaphragm into one end of said case so that said diaphragm engages said flange,

mechanically deforming the wall of said case at said one end so that a portion of said wall is bent over the edge of said diaphragm and clamps said edge to said flange,

providing a strain gage comprising a main portion which includes a resistance bridge and oppositely disposed tab portions which include leads for said bridge disposed in a predetermined geometric pattern,

inserting said strain gage into the other end of said case so that said main portion engages said diaphragm, and providing an adhesive between said main portion and said diaphragm,

adhesively securing at least a part of said main portion to said diaphragm,

providing a termination board having a plurality of conductive segments disposed in a geometric pattern similar to that of said gage leads,

positioning said termination board in the other end of said case so that said gage tab portions are sandwiched between said board and said flange and so that each of said segments is aligned and in electrical contact with the corresponding one of the leads of said strain gage, and

mechanically deforming the wall of said case at said other end so that a portion of said wall is bent over the edge of said board and clamps said board to said flange.

3,935,637

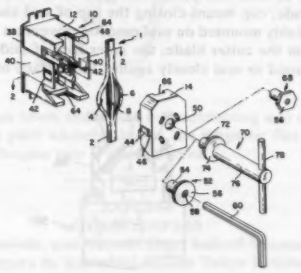
REMOVABLE WIRING DEVICE ASSEMBLY

Edward Dennman Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 26, 1974, Ser. No. 527,451

Int. Cl.² H01R *43/00*

U.S. Cl. 29—628 **7 Claims**



1. The method of assembling a wiring device on a multiconductor cable,

slitting portions of the cable to separate medial portions of the conductors therein,

spreading laterally apart from one another the medial portions of the conductors,

aligning the medial portions of the conductors with corresponding electrical terminals contained in a base portion of a wiring device overlying said medial portions with a cover portion of said wiring device,

displacing said cover and said base toward each other with a tool whereby said conductors are forced into electrical engagement with said terminals and whereby said cover and said base are locked together, and engaging said tool directly against at least one of said wires and forcing said wire into engagement with a corresponding terminal while displacing said cover and said base toward each other.

3,935,638

SHARPENER FOR ELECTRIC SHAVERS

James E. Rookus, 505 Cherry, S.E., Grand Rapids, Mich. 49503

Continuation-in-part of Ser. No. 436,174, Jan. 24, 1974, abandoned. This application June 12, 1974, Ser. No. 478,645

Int. Cl.² B26B *19/38*

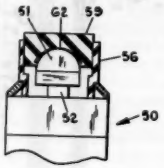
U.S. Cl. 30—37 **6 Claims**

1. Means for sharpening a cutter blade of an electric shaver having means resiliently mounting the cutter blade, said sharpening means comprising: a hollow case open at the bottom and shaped to seat over at least that portion of the shaver body having the cutter blade, cap means closing the top of said case; the inner face of said cap means being shaped to seat closely against the surface of a cutter blade; a thin sheet having an abrasive forming the inner surface of said cap; said cap having means for engaging the edges of said sheet for holding said sheet in compression and forcing it against the inner face of said cap; said cap when seated over said portion of said shaver

body pressing said abrasive material firmly against the resiliently mounted cutter blade.

4. Means for sharpening a cutter blade of an electric shaver, having means resiliently mounting the cutter blade, said sharpening means comprising: a hollow case open at the bottom to seat over at least that portion of the shaver body having the cutter blade, cap means closing the top of said case; said cap having a pair of downwardly opening elongated channels, said channels being spaced apart, parallel and arcuate in cross section and said abrasive material covering the entire walls of said channel; a downwardly opening slot in said cap parallel to and between said channels; said case having a bar extending across and dividing the open top of said case, said bar fitting closely in said slot for guiding said cap as it is moved toward and away from the cutter blade.

5. Means for sharpening a cutter blade of an electric shaver having means resiliently mounting the cutter blade, said sharpening means comprising: a hollow case open at the bottom to seat over at least that portion of the shaver body having the cutter blade, cap means closing the top of said case; said cap being slidably mounted on said case for movement toward and away from the cutter blade; the inner face of said cap means being shaped to seat closely against the surface of the cutter



blade; an abrasive material forming the inner surface of said cap, said cap when seated on said case pressing said abrasive material firmly against the cutter blade; said case being circular; said cap being circular and having guide means interfitting with said case to center said cap with respect to said case and to hold said inner face of said cap parallel with the top face of the cutter blade; said interfitting guide means being an upstanding annular wall on said case and a cooperating downwardly opening circular channel on said cap.

6. In combination, an electric shaver and blade sharpening means therefor, said electric shaver having at least one driven cutting blade, a removable screen; spring means resiliently urging said blade against said screen; said blade sharpening means having a hollow rigid body defining an internal cavity open at the bottom to seat over and be substituted for said screen with said blade received in said cavity; the top of said cavity being closed by a rigid blade engaging wall; said wall being a stationary part of said rigid body and having an inner rigid, non-compressible face for seating against said blade and displacing it against said spring means; the said inner face having an abrasive surface rigidly affixed thereto of a type adapted for sharpening said blade when said blade is moved over said surface.

3,935,639

SAFETY RAZOR

John C. Terry; Steven V. Barnett, both of Tilehurst, and John Lloyd, Wigston, all of England, assignors to The Gillette Company, Boston, Mass.

Filed Feb. 25, 1974, Ser. No. 445,431

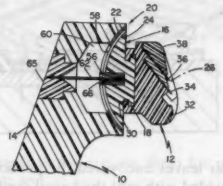
Claims priority, application United Kingdom, Mar. 13, 1973, 10065/73

Int. Cl.[2] B26B *21/22*

U.S. Cl. 30—47 14 Claims

1. A safety razor comprising a handle, a transversely extending support portion at one end of said handle, said support portion having an outwardly facing surface on which a shaving element is adapted to be carried in shaving position,

structure connecting said handle and support portion for angular rotation of said support portion relative to said handle in either direction from a medial position about an axis extending transversely of said supporting portion parallel to and immediately adjacent to a blade edge position as defined by said support portion, said connecting structure being located on the side of said support portion remote from said outwardly facing surface and



including interengaged flange and groove elements, the ends of said flange elements cooperating with the bases of said groove elements in thrust bearing relation, said connecting structure permitting pivotal movement of said support portion relative to said handle during the course of a shaving stroke, and restoring structure arranged to generate a force when said support portion is offset from said medial position relative to said handle tending to move said support portion towards said medial position.

3,935,640

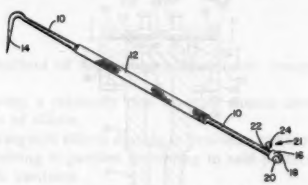
DENTAL INSTRUMENT

Richard Philip Cohan, No. 7 Hawkins Way, Larkspur, Calif. 94939

Filed Apr. 5, 1973, Ser. No. 348,386

Int. Cl.[2] A61C *3/00*

U.S. Cl. 32—40 R 10 Claims



1. A dental instrument comprising a metal shaft having an extension at one end thereof including a resilient, deformable surface thereon adapted to be pressed against a tooth to test the mobility of said tooth, and a periodontal probe at the other end of the metal shaft which includes a color-coded depth gauge.

3,935,641

ADJUSTABLE DRAWING SWEEP

Thomas P. Douglas, 2877 E. Fairmount, Phoenix, Ariz. 85016

Filed Oct. 29, 1974, Ser. No. 518,600

Int. Cl.[2] B43L *13/22*

U.S. Cl. 33—177 2 Claims

1. Adjustable drawing sweep apparatus, comprising, in combination:

a base member;

a flexible sweep member including a free end and a pinned end pivotally secured to one end of the base member;

a lever pivotally secured to the base member adjacent another end of the base member;

a plurality of notches on the lever for receiving the free end of the sweep member, each notch of which is offset from

an adjacent notch to provide a plurality of radii of curvature for the sweep member; and

means for adjusting the lever with respect to the base member to vary the radius of curvature of the sweep member.

3,935,642

DIRECTIONAL DRILLING OF BORE HOLES

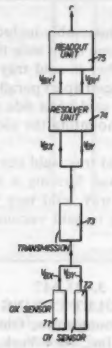
Anthony William Russell, 3, Culross Close, Cheltenham, England

Continuation of Ser. No. 197,416, Nov. 10, 1971, abandoned. This application Sept. 12, 1973, Ser. No. 396,634

Claims priority, application United Kingdom, Nov. 11, 1970, 53552/70

Int. Cl.² E21B *47/022*

U.S. Cl. 33—302 **7 Claims**



1. A method for determining the roll angle of a drill head in a borehole where the azimuth and inclination of the borehole and the magnetic dip at the borehole location are known, including the steps of: sensing with a tool the vector components of the earth's magnetic field along a set of tool fixed axes; providing signals indicative of such sensed vector components from the tool location to a remote location; modifying such signals indicative of sensed vector components by vectorially rotating such vector indicative signals through an angle that is a function of the known azimuth, inclination, and magnetic dip for providing the roll angle of the drill head.

3,935,643

METHODS OF AND MEANS FOR MEASURING ANGLES

Michael King Russell, 3, Culross Close, and Anthony William Russell, 265, Old Bath Road, both of, Cheltenham, England

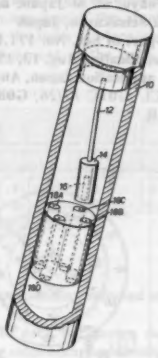
Filed Nov. 29, 1974, Ser. No. 528,391

Claims priority, application United Kingdom, Dec. 12, 1973, 57645/73

Int. Cl.² G01C *9/04, 9/14;* G01S *3/30*

U.S. Cl. 33—312 **8 Claims**

1. Apparatus for measuring both the angle between the gravity vector and a particular axis of a body and the angle between the direction of projection of the gravity vector on to a plane at right angles to said particular axis and an axis fixed with respect to said body and lying in said plane, comprising a transducer having a pendulum beam bar magnet mounted on the free end of said pendulum beam, four solenoids forming two differential fluxgate pairs confronting said magnet and disposed symmetrically with respect to the neutral position of



the pendulum beam and means interconnecting said differential fluxgate pairs whereby, in use, the magnetic flux in each respective fluxgate pair is equal to zero.

3,935,644

GYROCOMPASS

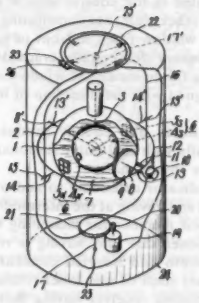
Shin-ichi Kawada, and Takeshi Hojo, both of Yokohama, Japan, assignors to Kabushiki Kaisha Tokyo Keikio, Tokyo, Japan

Filed Feb. 9, 1973, Ser. No. 331,257

Claims priority, application Japan, Feb. 12, 1972, 47-15134

Int. Cl.² G01C *19/38*

U.S. Cl. 33—324 **9 Claims**



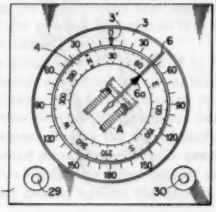
1. In a gyrocompass having a gyro rotor with a substantially horizontal spin axis, a gyro case for said gyro rotor, a support means for suspending the gyro case along a substantially vertical axis for north-seeking action, the improvement comprising means for applying a torque to said gyro rotor about said substantially vertical axis in proportion to the inclination angle of said spin axis from a horizontal plane to attenuate oscillatory action of said gyro rotor, means for detecting said inclination angle, circuit means intermediate of said detection means and the torque applying means for causing said torque to be applied to said gyro rotor at a repetition rate substantially equal to the north-seeking oscillatory rate of the gyro rotor, and means for causing said torque to approach zero as said north-seeking oscillatory action approaches a damped steady inclination angle.

3,935,645

APPARATUS FOR INDICATING RELATIVE AZIMUTH

Michio Okamoto, Fujisawa; Shigeru Izawa, Musashino, and Michio Hara, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Continuation-in-part of Ser. No. 171,133, Aug. 12, 1971, abandoned. This application Aug. 13, 1974, Ser. No. 497,045
Claims priority, application Japan, Aug. 13, 1970, 45-70393
Int. Cl.[2] G01C *17/26*; G08C *19/00*
U.S. Cl. 33—363 R 3 Claims



1. An arrangement for indicating a relative azimuth between two objects remote from each other, such as a control station having therein a first detector for detecting a true azimuth thereof and a mobile unit remotely controlled by the control station which has therein a second detector for detecting a true azimuth thereof, comprising:

a first synchronous transmitter mounted on the control station for generating and transmitting a signal corresponding to the true azimuth of the control station detected by said first azimuth detector; a second synchronous transmitter mounted on the mobile unit for generating and transmitting a signal corresponding to the true azimuth of the mobile unit detected by said second true azimuth detector;

a frame installed in the control station for protecting and supporting other elements constituting said device;

a transparent window fitted in front of said frame;

an outer stationary dial equally graduated and fixedly secured to the frame inside the window and having a mark thereon aligned with the direction of heading of the control station;

an inner rotatable dial equally graduated and disposed concentrically with said outer stationary dial and including a hollow rotary shaft;

a rotatable indicator extending to and over said outer stationary dial and having at the intermediate part thereof an arrow shaped member for indicating the graduations of the inner inner dial and having a rotary shaft fixedly secured thereto and inserted concentrically within said hollow rotary shaft of said inner rotatable dial;

a first synchronous receiver having therein a rotary shaft and means for providing the rotary shaft with rotation by receving the signal transmitted from said first synchronous transmitter mounted on the control station;

a second synchronous receiver having therein a rotary shaft and means for providing the rotary shaft with rotation by receiving the signal transmitted from said second synchronous transmitter mounted on the mobile unit; and

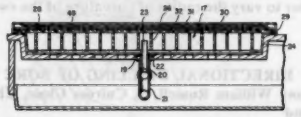
means for transmitting said rotations of said first and second synchronous receivers to said inner rotatable dial and the rotatable indicator such that the true azimuth of the control station is represented on the graduation of said inner rotatable dial indicated by said mark provided on said outer stationary dial, and that of the mobile unit is represented on the graduation of said inner rotatable dial indicated by said arrow shaped member provided in the intermediate part of said rotatable indicator, and moreover the relative azimuth between the control station and the mobile unit is represented on the graduation of said outer stationary dial indicated by the leading and of said rotatable indicator.

3,935,646

GEL ELECTROPHORESIS SLIDE DRYING

Joseph D. Grandine, Acton, and James E. Snyder, Brighton, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Nov. 15, 1974, Ser. No. 524,364
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—92 6 Claims



3. Apparatus for drying a gel electrophoresis slide comprising,

a housing having a generally rectangular recessed portion, said housing having a vacuum connection in said housing recess,

a subassembly, said subassembly including a generally rectangular tray having one open side therein,

a ribbed support member in said tray supporting a planar porous surface in spaced apart parallel relation to the side of said tray opposite said open side and coextensive with said open side, for mounting the electrophoresis slide to be dried, and

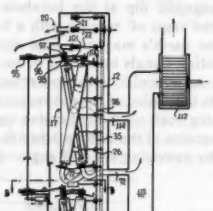
a cover member for said tray, said cover member including a resilient surface pad forming a substantially vacuum tight seal with said tray, said tray having a connection therein for coupling to said vacuum connection within said housing.

3,935,647

ULTRAVIOLET CURING OVEN

Anton A. Aschberger, Youngstown, Ohio, assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 16, 1974, Ser. No. 489,055
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—105 20 Claims



1. Apparatus for drying articles comprising a housing, conveying means for conveying articles along a path of travel in said housing, means for drying articles during the movement thereof in said housing by said conveying means, said drying

means being at least a pair of heat sources disposed to normally direct heat toward the path of travel of said conveying means, said pair of heat sources being disposed in opposing relationship to each other on opposite sides of said path of travel, said pair of heat sources having longitudinal axes disposed along but askewed to the path of travel of said conveying means, the skewing of said pair of heat sources being in directions opposite each other, means for redirecting the normal direction of heat application away from said path of travel to prevent heat damage to the articles carried by said conveying means, and said redirecting means including means for rotating said heat sources away from the path of travel of said conveying means about axes generally parallel to said longitudinal axes.

3,935,648

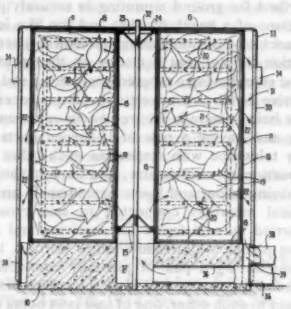
TOBACCO CURING APPARATUS AND METHOD

Jack R. Cox, P.O. Box 1104, Myrtle Beach, S.C. 29577

Filed Nov. 7, 1974, Ser. No. 521,778

Int. Cl.² D06F *58/00*; F26B *11/02*

U.S. Cl. 34—131 **13 Claims**



1. An apparatus for curing tobacco leaves comprising means defining an annular curing air confining enclosure, a plurality of foraminous baskets for leaves adapted to be arranged in a circular array within the enclosure wherein said baskets form a central verical passage in the center of said circular array and an exterior annular return passage defined by the inner wall of the enclosure and the outer wall of said baskets, and means on the baskets adapted to engage masses of tobacco leaves therein and to hold said leaves relatively fixed against appreciable movement during curing with the leaves held approximately edgewise to the direction of curing air flowing therethrough radially between said passages.

3,935,649

MULTI-PURPOSE MATHEMATICAL AID

James Richard Harte, 10 W. Concord, Kansas City, Mo. 64112

Filed Mar. 1, 1974, Ser. No. 447,084

Claims priority, application United Kingdom, Nov. 9, 1973, 52214/73

Int. Cl.² G09B *19/02*

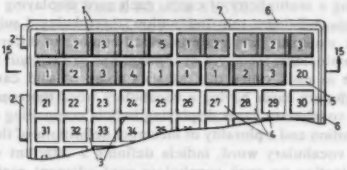
U.S. Cl. 35—31 D **6 Claims**

1. A mathematical aid comprising:

a counting member having an upper face provided with a pattern of ridges having sloping sides and dividing the face into an arrangement of n × n recessed areas representing an orderly series of numbers; and

a plurality of solid, relatively thin, multiple segment counting bars which may be positioned on said member to portray mathematical relationships, each bar comprising a plurality of joined segments defining units that collectively represent a number,

each of said bars presenting opposed, upper and lower major surfaces, said lower surface having channel-like recesses therein provided with sloping sides for complementally receiving said ridges on the member to nest each unit of the bar in any one of the areas of said member, whereby to retain the units in place and provide selfcentering and self-alignment of the units of each bar with



respect to the corresponding selected areas of said member,

said upper surface of each bar having ridges thereon provided with sloping sides complementally receivable in the channel-like recesses in the other of said bars upon stacking thereof to center and align the units of the stacked bars.

3,935,650

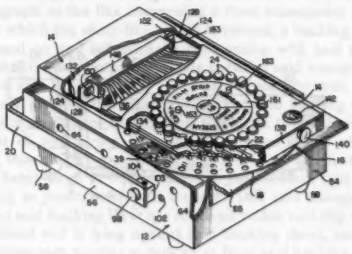
SCHOLASTIC TEST AND GRADING APPARATUS

Donald R. Hully, 1404 E. Stop 11 Road, Indianapolis, Ind. 46227

Filed July 31, 1974, Ser. No. 493,318

Int. Cl.² G09B *5/00*

U.S. Cl. 35—48 B **26 Claims**



1. Test and grading apparatus, comprising:

an answer sheet having answer indicia thereon defining a circular series of angularly-spaced row of radially-spaced answer spaces representing different answers to questions of a series corresponding to the series of rows, said sheet being adapted to have answers indicated thereon by markings or the like at said answer spaces,

said sheet also having orientation indicia thereon to define a plurality of orientations in which the sheet may be applied to sensing means for scoring correct answer markings thereon,

sensing means having a circular series of sensing elements angularly spaced for alignment with said rows of answer spaces and radially spaced for alignment with selected ones of the answer spaces of the rows, to sense correct answers in such spaces,

orientation means for selectively orienting answer sheets with respect to the sensing means in accordance with designated orientation indicia on the answer sheets,

means for bringing such answer sheets into sensing relation with the sensing means in the designated orientations for sensing correct answers thereon,

and indicating means to indicate for observation the results of such sensing.

3,935,651

VOCABULARY PLAYING CARDS

Robert T. Mankoff, and Marcy Mankoff, both of 73-11 Bell Blvd., Bayside, N.Y. 11364

Filed June 10, 1975, Ser. No. 585,482
Int. Cl.² A63H 33/04
U.S. Cl. 35—71 6 Claims

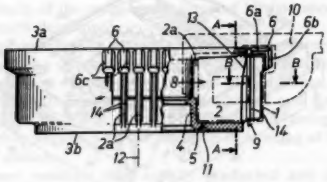
1. Vocabulary building playing cards comprising a deck having a multiplicity of cards, each card displaying symbolic indicia defining a suit designation, there being 4 suits in said deck, each suit having a prescribed number of different value denominaions, the value denominations of each suit being the same as each other suit, at least some of said cards being vocabulary cards having a vocabulary word thereon, each of said vocabulary cards displaying indicia comprising a correct definition and a plurality of incorrect definitions of the respective vocabulary word, indicia defining a different value denomination on each vocabulary card adjacent each correct and each incorrect definition, the value denomination of each vocabulary card being that corresponding to the correct definition of the vocabulary word.

3,935,652

CIRCULAR MAGAZINE FOR A SLIDE PROJECTOR

Hans Mulch, Wetzlar, Germany, assignor to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed June 26, 1974, Ser. No. 483,397
Claims priority, application Germany, July 7, 1973, 2334578
Int. Cl.² B42F 17/00
U.S. Cl. 40—78 7 Claims



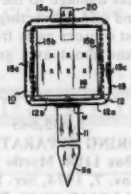
1. A circular magazine for rectangular slides comprising an annular bottom wall (5) with a hub (4) defining a boundary wall rising from the inside diameter of said bottom wall, a plurality of compartment walls distributed uniformly and radially around said hub extending from said bottom wall and said hub, said compartment walls (*2a*) having lengths parallel and vertical to said bottom wall and corresponding substantially to the lengths of a rectangular slide, the compartment walls having securing means (6) diagonally opposite the intersection of said bottom wall and said hub, said securing means comprising bulges for precluding accidental ejection of the slides and defining slits (7) between each neighbored compartment wall, said slits being narrower than the thickness of a slide being used, said hub being of low height compared to the vertical length of the compartment walls, said hub, said bottom wall and said securing means matingly receiving rectangular slides lying with one edge on said bottom wall and between said compartment walls, said securing means and said bottom wall having a combined length less than said parallel length of the compartment walls and being disposed to each other without overlapping.

3,935,653

BEACH BLANKET STAKING DEVICE

William H. Klein, 400 Kings Point Drive, Apartment 1131, Miami, Fla. 33160

Filed Feb. 1, 1973, Ser. No. 328,736
Int. Cl.² G09F 7/18
U.S. Cl. 40—125 H 3 Claims



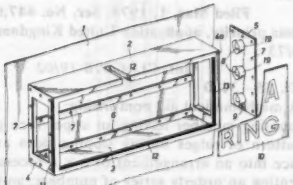
1. In an advertising staking device of the character shown and described for ground mounting to securely position side edge portions of a beach blanket and the like in an upright wall-like enclosing position along and with respect to a central body portion thereof that is resting on the ground, an elongated drive stem having a tapered lower drive end, a vertically upright drive head and advertising plaque-receiving frame, said frame being centrally secured on an upper end portion of said stem and having a pair of U-shaped parts adapted to adjustably telescope with respect to each other to define a window portion of variable size, said parts in their telescopic relation having upper and lower spaced-apart cross members and vertical members connected to said cross members, means carried by said frame for receiving and retaining an advertising plaque within said window portion, blanket clipping means having a pair of pivotally connected jaws and spring means for urging said jaws towards a closed relation with respect to each other, one of said jaws being substantially centrally secured to the upper cross member of said upper frame part to mount said jaws to extend in a plane substantially parallel to said frame and in a vertical downwardly opening blanket edge-receiving position, and said clipping means being adapted to receive and retain an adjacent side edge portion of the blanket in an upright wall-like enclosing position along the device.

3,935,654

ILLUMINATED VEHICULAR DISPLAY SIGN

Irene E. Rubin, Houston, Tex., assignor to Irene E. Rubin, Houston, Tex.

Continuation of Ser. No. 290,434, Sept. 20, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 507,341
Int. Cl.² G09F 7/00
U.S. Cl. 40—129 C 7 Claims



1. An illuminated display sign peculiarly adapted for mounting on a side panel of a road vehicle, comprising

a frame assembly of generally rectangular parallelepiped configuration having an elongated dimension to be disposed parallel to the longitudinal axis of a road vehicle, said frame assembly being composed of

a pair of vertical side members disposed at opposed ends of the assembly, each side member having a slot-like groove therein adapted to receive the thickness of a sheet of glass or other display panel, said grooves being disposed to face one another and one of them extending all of the way through the side member to serve as an aperture for mounting and dismounting said display panel,

a pair of generally horizontal top and bottom members interconnecting said side members, each top and bottom member having a slot-like groove therein adapted to receive the thickness of said display panel, said grooves also being disposed to face one another and to cooperatively register with said grooves in the side members to retain said panel, and

rib means which may be integral with said top and bottom members extending horizontally between and interconnecting said pair of side members, said rib means having a multiplicity of horizontally spaced openings therethrough which serve to receive connecting members to secure the sign to the side of a vehicle, said rib means being of relative short vertical dimension to leave the back face of the assembly relatively open, whereby the side of the vehicle is utilized to close the back of the assembly and serves as a light reflecting surface,

a translucent rectangular display panel having a message-bearing surface thereon and slidably insertable through said aperture groove into said pairs of grooves in the side members and top and bottom members to close the front face of said frame assembly, and

a plurality of light sources mounted within said frame assembly to provide indirect lighting for said display panel.

3,935,655

VANDAL-PROOF STREET NAME SIGN

George H. Fritzinger, 217 W. Grant Ave., Edison, N.J. 08817

Filed Aug. 12, 1974, Ser. No. 496,706
Int. Cl.² G09F *07/18*
U.S. Cl. 40—145 R 8 Claims

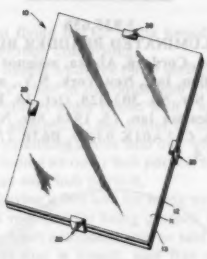
1. In a street name sign: the combination of a sign head structure comprising one or more hollow sign heads each having name panels at the opposite sides thereof, a center staff passing vertically through said head structure, a top cap in interlocking engagement with the upper end of said sign head structure and secured to the upper end of said center staff, a post cap receiving the lower end of said center staff and adapted to fit over the upper end portion of a cylindrical post for supporting said sign at a suitable elevation above the ground, pointed set screws threaded through the side wall of said post cap for locking engagement with the wall of said post, securing means on said center staff tightened against said post cap to clamp said sign head structure between said top cap and said post cap via said center staff, an arm of solid rod stock secured to the lower end of said center staff in substantial extension beyond said post cap and a collar secured to the lower end of said arm for engaging the inside wall of a post supporting said sign with a clearance fit at a substantial distance below said post cap to retain said post cap in upright position on said post and to relieve the post cap from strain tending to break it upon an excessive tilting force being exerted on said sign head structure.

3,935,656

PICTURE FRAME SYSTEM

William Stratton Pritchard, 201 Avery Drive NE., Atlanta, Ga. 30309

Filed May 17, 1974, Ser. No. 470,824
Int. Cl.² G09F *1/12*
U.S. Cl. 40—155 1 Claim



1. A frame system for mounting a sheet-like article such as a photograph or the like comprising a front transparent sheet through which the sheet-like article is viewed; a backing layer superposed on and substantially coextensive with said transparent sheet, said photograph being between said transparent sheet and said backing layer; a first pair of resilient rods, each rod of said first pair of rods lying against said backing sheet adjacent to an edge of said backing sheet, the two rods of said first pair of rods being adjacent to opposed edges of said backing sheet; a first pair of clips, each clip of said first pair of clips being fixed to one of said first pair of rods, said each clip being so constructed and arranged that said transparent sheet and said backing layer are received within said clip while said resilient rod is lying against said backing sheet, each of said resilient rods tending to bow away from said backing layer generally at the mid portion of said resilient rods; a second pair of resilient rods, each rod of said second pair of rods lying adjacent to an edge of said backing layer substantially perpendicular to said first pair of rods, each rod of said second pair of rods including an end section to overlie one rod of said first pair of rods; a second pair of clips, one clip of said second pair of clips being fixed to each rod of said second pair of rods and adapted to receive said transparent sheet and said backing layer therein; and a brace rod, said brace rod extending diagonally across said backing layer, each end of said brace rod being received within one of said end sections of said second pair of rods.

3,935,657

RIFLE REST

Virdell H. Wade, Rte. 2, Box 116 B, Chandler, Ariz. 85224

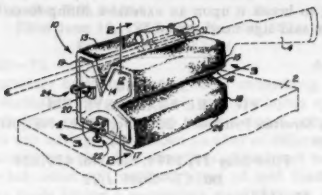
Filed July 3, 1974, Ser. No. 485,512
Int. Cl.² F41C *29/00*
U.S. Cl. 42—94 6 Claims

1. Rifle rest apparatus, comprising, in combination:

block means;

groove means extending into the block means along the length of the block means for receiving a portion of a rifle and for supporting the rifle; and

means for adjusting the elevation of a portion of the block means, including a bracket secured to an end of the block



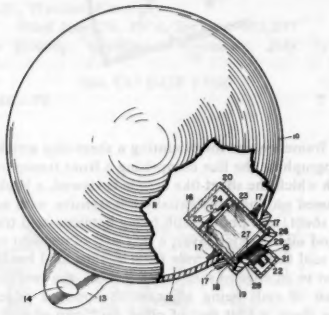
means and adjustable screw means extending through said bracket.

3,935,658

ILLUMINATED BLADDER BUOY

Kenneth Simpson, Cordova, Alaska, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Continuation of Ser. No. 302,028, Oct. 30, 1972, abandoned. This application Jan. 15, 1974, Ser. No. 433,598
Int. Cl.[2] A01K *93/00*; B63B *21/00*
U.S. Cl. 43—17.5 2 Claims



1. A bladder buoy suitable for the supporting of fish nets, trap lines and other fishing gear, the outer membrane of which is illuminated by means of a battery-powered flashlight located inside the buoy, cosisting of

an inflated translucent or semi-opaque membrane in the shape of a sphere with positive flotation characteristics, inside of which, in a transparent housing, is mounted a battery and flashlight bulb,

said housing enclosing the flashlight and battery being sealed from the interior inflated recess of the buoy,

with the housing supporting the flashlight bulb and battery mounted inside the buoy and extending externally of the buoy surface, with means mounted in the external part of said housing for removing and replacing the bulb and the battery, said means providing a waterproof seal of the flashlight housing unit when the housing is closed, with the housing unit serving to seal the interior of the balloon when the housing is closed, or open for replacement of a bulb or battery.

3,935,659

PHOSPHORESCENT FISHING LURE

James B. McCallum, Wendham St., R.F.D. No. 3, Plymouth, Mass. 02360

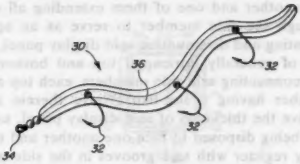
Filed Oct. 29, 1974, Ser. No. 518,562
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—17.6 1 Claim

1. An improved fishing lure especially adapted to glow and thereby attract fish and comprising:

a. a translucent fishing lure body being adapted to attract fish for feeding purposes;

b. a leader running along the inside of said fishing lure body to couple hooks to the fishing lure body;

c. at least one hook coupled to said leader to hook a fish attempting to eat the lure body; and



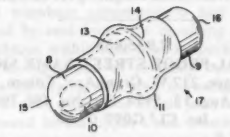
d. said leader being formed of a phosphorescent material which, after being subjected to irradiation will itself radiate light, whereby the fishing lure will be more conspicuous, especially in darkened waters, and will attract more fish.

3,935,660

NOISEMAKING DEVICE FOR USE WITH FISHING LURE OR BAIT AND METHOD OF MAKING SAME

Franklin T. Plew, P.O. Box 1418, Bloomington, Ind. 47401

Filed Mar. 17, 1975, Ser. No. 559,221
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.31 14 Claims



1. A noisemaking device for use with a fishing lure or bait comprising:

first and second metal cups each having a closed end and an open, flanged end, assembled with their flanged ends in abutting relation to form a closed container;

one or more metal balls loosely received in said container;

and a shrinkable sleeve surrounding the abutting flanged ends of said cups and shrunk about the same to secure the cups in assembled relation.

3,935,661

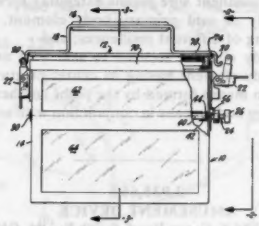
PORTABLE RODENT EXTERMINATOR

Daniel B. Meyers, 164 Rome St., San Francisco, Calif. 94112, and Gary C. Yerby, 78 Lausanne St., No. 2, Daly City, Calif. 94104

Filed Nov. 20, 1974, Ser. No. 525,658
Int. Cl.[2] A01M *23/02*
U.S. Cl. 43—60 6 Claims

1. A portable rodent exterminator comprising: a container having an enclosable inside chamber and an open top, a top cover, coupling means on said open top of said container for mounting said top cover on said container, said coupling means being further adapted to couple an open end of a rodent trap container to said container, said coupling means having further sealing means on said open top of said container for hermetically sealing said top cover and said container, said sealing means being adapted to provide a substantially sealed coupling seating when said container is coupled

to the open end of a rodent trap container, cooperating means on said top cover and said container for releasably attaching said top cover to said container, a divider plate positionable



within said container, and, means for reversibly displacing said divider plate across said inside chamber selectively forming an enclosed inside chamber and an open inside chamber.

3,935,662

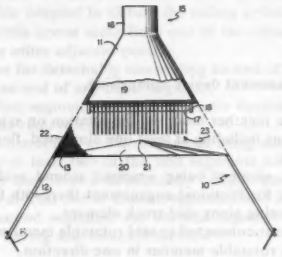
ELECTRONIC INSECT TRAP

Michael Hamid; Emil Krush, both of Winnipeg, and Roger Boulanger, Calgary, all of Canada, assignors to Alladin Enterprises Ltd., Winnipeg, Canada

Filed Oct. 25, 1974, Ser. No. 517,938

Int. Cl.² A01M *1/22*

U.S. Cl. 43—112 6 Claims



1. An insect trap connectable to a source of electrical power and comprising in combination a supporting framework, insect attractant means supported by said framework, electronic means supported within said framework and a killing grid operatively connected to said electronic means and also supported within said framework in the vicinity of said insect attractant means, said grid including opposing members having an air gap therebetween, said electronic means supplying electrical power to said grid whereby an arc is struck across said opposing members when an insect reduces the air gap therebetween by a predetermined amount, said insect attractant means including a source of ultra-violet light in said framework, an upper reflector in said framework above said source of ultra-violet light and a lower reflector below said source of ultra-violet light, said killing grid being situated between said reflectors and between said source of ultra-violet light and the exterior of said framework, said upper reflector including a substantially planar disc spanning said framework, said lower reflector including a substantially conical disc also spanning said framework in spaced relationship to said upper disc and with the apex of said conical disc extending towards said upper disc adjacent the center thereof whereby the ultra-violet light from said source thereof is reflected down from said upper reflector onto said lower reflector and radiated outwardly from said lower reflector.

3,935,663

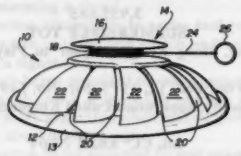
FLYING TOY

Martin N. Leibowitz, 1620 Oak Meadows Drive, Irving, Tex.

Filed July 22, 1974, Ser. No. 490,368

Int. Cl.² A63H *27/12*

U.S. Cl. 46—60 6 Claims



1. A free flight flying toy for being tossed through the air with a spinning motion comprising:

a circular disc having a convex outer surface comprising the upper surface when in operation and configured to produce lifting effects when tossed with a spinning motion,

a circular reel attached to the center of said convex outer surface and extending above said disc when in operation, said reel including an outer hub portion and a stem of less diameter than said hub portion,

a flexible line having a free end for being wound around said stem of said reel and for being grasped at the other end in order to impart additional spin to said disc by unwinding after said disc is tossed, said free end of said line disengaging from said reel when said line is fully unwound to provide free flight to said disc, and

vent openings being formed at equally spaced points about said disc in order to create additional lift to said disc.

3,935,664

CONNECTOR ARRANGEMENT FOR DETACHABLE FASTENING OF AIRPLANE WINGS TO THE FUSELAGE OF MODEL AIRPLANE

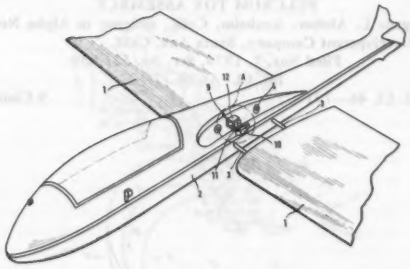
Hermann Neuhierl, Waldstrasse 36, 8510 Furth, Bayern, Germany

Filed May 2, 1975, Ser. No. 573,995

Claims priority, application Germany, May 3, 1974, 2421418

Int. Cl.² A63H *27/02*; B64C *1/26*

U.S. Cl. 46—76 R 2 Claims



1. In a connector arrangement for the detachable fastening of airplane wings to the fuselages of model airplanes, including sleeves in said fuselages, and pins in said airplane wings adapted to be located in said sleeves for attaching said wings to said fuselages, the improvement comprising tongue and groove connector elements for pressing said wings against said fuselage; a rubber band imparting a tensile force to said connector elements, each said connector element being adapted to be pulled out and rotated into a second position in which

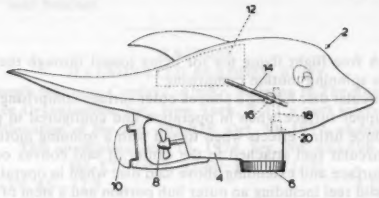
said connector element is insertable into a complementary-shaped cut-out formed in the end surface of the airplane wing proximate thereto, and rotatable into a first position in which said airplane wing is maintained in engagement with said fuselage.

3,935,665

SUBMERSIBLE TOY

Duncan Tong, Hong Kong, assignor to Playart Ltd., Hong Kong

Filed Feb. 12, 1975, Ser. No. 549,410
Claims priority, application United Kingdom, Feb. 21, 1974, 08051/74
Int. Cl.² A63H *23/04*
U.S. Cl. 46—91 9 Claims



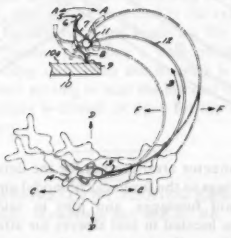
1. A submersible toy or model, comprising:
a body member;
a motor and propellor attached to said body member to propel it in a forward direction;
at least one elevator flap attached to said body member at a selectively fixed downward inclination to the forward direction of movement of the body, whereby downward pressure acting on said elevator flap causes said body to submerge as it is propelled in said forward direction by said motor and propellor; and
a watertight buoyancy compartment attached to said body member, said compartment being sized so that the bouyancy thereof eventually overcomes said downward water pressure and causes said body member to resurface,
whereby the toy or model continually submerges and resurfaces when placed in the water with said elevator flap in said selectively fixed downward inclination and said motor on.

3,935,666

FULCRUM TOY ASSEMBLY

Eugene L. Absher, Anaheim, Calif., assignor to Alpha Nova Development Company, Santa Ana, Calif.

Filed Nov. 7, 1974, Ser. No. 521,639
Int. Cl.² A63H *13/12*
U.S. Cl. 46—131 9 Claims



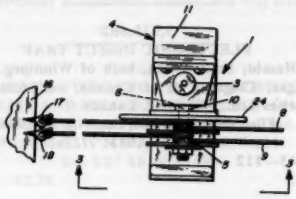
1. A fulcrum toy assembly comprising:
a primary body element provided with plurality of point contact means for engaging a support base thereby providing a fulcrum means which permits said primary body element to reciprocate in a vertical plane, said point contact means being a pair of spatially situated pointed elements positioned so as to be in a plane normal to the direction of reciprocation of the primary body element;
a plurality of resilient wire means extending forwardly and downwardly of said primary body element, said wire means being of different resiliences; and
a second body element secured to said wire means, said second body element having its center of gravity below the fulcrum means formed by the point contact means of said primary body means in conjunction with said support base.

3,935,667

AMUSEMENT DEVICE

Louis O. Vitt, 1235 S. Green Road, South Euclid, Ohio 44121

Filed Feb. 25, 1974, Ser. No. 445,683
Int. Cl. A63h *18/06*
U.S. Cl. 46—202 10 Claims



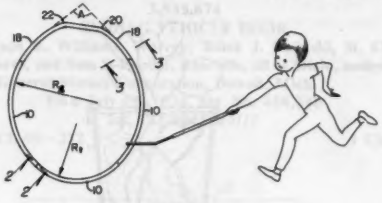
1. An amusement device comprising,
a housing,
a rotatable member mounted for rotation on said housing,
track means including at least one elongated, flexible track element,
said track element being wrapped around said rotatable member for frictional engagement therewith for moving said housing along said track element,
power means connected to said rotatable member for rotating said rotatable member in one direction,
said track element having its opposite ends extending tangentially and in generally opposite directions from generally one side of said rotatable member whereby upon the application of tension to said track element a frictional force will result between said track element and said rotatable member to cause said housing to move along said track element at a speed related to the frictional force between said track element and said rotatable member,
said track means includes a pair of track elements wrapped about said rotatable member,
one of said track elements is wrapped around said rotatable member having its opposite ends extending generally tangentially from generally one side of said rotatable member, and
the other of said track elements is wrapped around said rotatable member having its opposite ends projecting tangentially from a generally diametrically opposite side of said rotatable member from said one side whereby said housing can move in one direction when the frictional force between said one track element and said rotatable member exceeds the frictional force between said other track element and said rotatable member and can move in the opposite direction when the frictional force between said other track element and said rotatable member exceeds the frictional force between said one track element and said rotatable member.

3,935,668

NON CIRCULAR HOOP

James T. Phillips, Jr., 4336 W. 59th Place, Los Angeles, Calif. 90043

Filed Nov. 29, 1974, Ser. No. 528,352
Int. Cl.² A63H *33/02*
U.S. Cl. 46—220 10 Claims



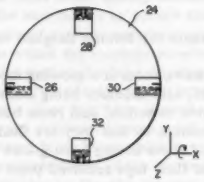
1. In a hoop of the type adapted to be rolled along a surface with a propelling trundle comprising;
   a. a plurality of first segments and at least one second segment adapted to be interchangeably assembled in various combinations to form hoops of various sizes and various shapes,
   b. the first segments being formed of flexible material of uniform cross section, such as plastic tubing,
   c. the second segment being formed of like material of like cross section and having a knuckle thereon formed at the juncture of angularly related portions having centers of curvature which are considerably spaced apart, said knuckle adapted to disturb the rolling action of the hoop as it rolls across same from one of the adjacent portions to the other adjacent portion,
   d. means for detachably connecting an end of any segment with an end of any other segment,
   e. the first segments being sufficiently flexible to bend to various radii of curvature,
   f. the construction and arrangement being such that:
   g. when at least two of the first segments are secured together they form a substantially circular hoop, and
   h. when at least one of the first segments and at least one of the second segments are secured together they form a hoop having said knuckle thereon.

3,935,669

ELECTRICAL SIGNAL MECHANISM ACTUATED IN RESPONSE TO ROTATION ABOUT ANY OF THREE AXES

Stanley G. Potrzuski, 452 Elrino St., and Walter John Potrzuski, 9 N. Montford Ave., both of Baltimore, Md. 21224

Filed June 3, 1974, Ser. No. 476,038
Int. Cl.² A63H *33/26*
U.S. Cl. 46—228 8 Claims



1. An object which generates a signal only when in rotation and when in rotation generates a continuous signal comprising:
   a support structure,
   circuitry mounted to said support structure comprising a power source,
   switch means including a first switch which can assume its ON position in response to centrifugal force,
   said switch means further including a second switch which assumes its ON position in response to centrifugal force,
   means for generating a signal,
   means connecting electrically in series said power source, said first switch, said second switch and said means for generating a signal,
   said first switch being mounted to said support structure in a position such that it is in its ON position as a result of centrifugal force generated when said support structure is in rotation about a given axis,
   said second switch being mounted to said support structure in a position such that it is in its ON position as a result of centrifugal force generated when said support structure is in rotation about said axis and so that it is in its OFF position when said support structure is not in rotation and when said first switch is in its ON position due to gravity rather than to rotation,
   whereby said means for generating a signal is actuated only when said support structure is in rotation and whereby when said support structure is in rotation said means for generating a signal is actuated continuously,
   said switch means further including a third switch and a fourth switch which can assume their ON positions in response to centrifugal rotation, means connecting said third and fourth switches in series with a power source and a signal generating means, said switches being mounted in positions in said support structure whereby rotation of said object about its X-axis causes said first and second switches to assume their ON positions, rotation of said object about its Y-axis causes said third and fourth switches to assume their ON positions and rotation of said object about its Z-axis causes said first, second, third and fourth switches to assume their ON positions.

3,935,670

APPARATUS FOR SELECTIVELY APPLYING ELECTRICAL CURRENT TO PLANTS

Ricks H. Pluenneke, Greenwood, and Willis G. Dykes, Vicksburg, both of Miss., assignors to Lasco Corporation, Greenwood, Miss.

Filed Nov. 1, 1974, Ser. No. 520,229
Int. Cl.² A01M *21/00*
U.S. Cl. 47—1.3 2 Claims

1. Apparatus for selectively destroying plants by the application of electrical current thereto, comprising
   a. a source of high-voltage electrical current,
   b. movable means for mounting said source of electrical current for movement,
   c. safety grounding means for providing continuous grounding of said source of electrical current during movement thereof, said grounding means comprising a sharpened electrically conductive wheel attached to said movable means, and means being provided for selectively moving said wheel into and out of ground engagement,

d. means for transferring electrical current from said source to selective plants to be destroyed, said means including (i) a non-conductive staff member adapted to be grasped by an operator, (ii) a single semi-circularly shaped dull-edged conductive member operatively attached to said staff member and adapted to be brought into engagement with plants to be destroyed, (iii) a high-voltage circuit adapted to connect said conductive member to said source of electrical current, (iv) a normally spring-biased open first electrical switch interposed in said high-voltage circuit, (v) means for selectively closing said first electrical switch against said spring bias, said means including a low-voltage control circuit and a spring-biased open sound electrical switch disposed in said low voltage control circuit, said second electric switch having an actuator mounted on said non-conductive staff member.

3,935,671

MODULAR PLANTER PANEL SYSTEM

Olaf Soot, 9 Tomahawk Lane, Greenwich, Conn. 06830

Filed Feb. 11, 1974, Ser. No. 440,949
Int. Cl.² A01G *9/02, 9/12;* **A47G** *7/02;* **F06B** *9/00*
U.S. Cl. 47—34 R **20 Claims**

1. A movable module for use as a decorative room divider, partition, or the like, for use with a climbing plant, said movable module comprising:

a stiff self-supporting planar frame, said frame including at least one top horizontal member, at least one bottom horizontal member, and at least two vertical members removably connected to said top and bottom members, said top, bottom, and vertical members defining the plane of said frame, said top, bottom, and vertical members each including means from which said module can be selectively supported from any one or more than one of said frame members whereby said module can be supported by several different modes of external support;

a horizontal planter box for a plant comprising an inner container with drainage holes and an outer container;

planter box attaching means located within said frame plane centrally attaching said planter box within said frame members; and

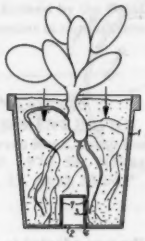
relatively flexible plant supporting means connected to and supported by said frame members, within said frame members and above said planter box for supporting growing portions of a plant.

3,935,672

DEVICE FOR THE RETENTION OF WATER IN FLOWER CONTAINERS

Louis-Robert Chatelain, Case Postale 217, 1211 Geneva 26, Switzerland

Filed Aug. 5, 1974, Ser. No. 494,860
Int. Cl.² A01G *9/02*
U.S. Cl. 47—34 A **2 Claims**



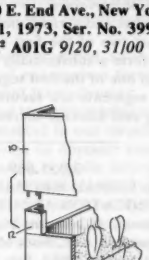
1. In combination with a container for receiving earth and plants, a water-retention device comprising a hollow cylindrical body having opposite ends and a continuous side wall, one said end surrounding an opening in the bottom of the container in watertight sealed relationship with the marginal edges of said opening, the other end being closed, and having at least one opening through said side wall of said hollow body adjacent said closed end and substantially closer to said other end than to said one end, said device being imperforate between said at least one opening and the bottom of the container whereby water can be stored in the container up to the level of said at least one opening.

3,935,673

PRODUCTION OF BELGIUM ENDIVE

Sy Raymond Robins, 180 E. End Ave., New York, N.Y. 10028

Filed Sept. 21, 1973, Ser. No. 399,540
Int. Cl.² A01G *9/20, 31/00*
U.S. Cl. 47—58 **9 Claims**



1. The technique for forcing Belgium endive, comprising the steps of:

A. planting endive roots in a growing medium contained in pallet boxes, said medium being constituted by sterilizable, reusable materials, said roots being planted in said growing medium so that they are flush with the surface thereof, said roots having been grown in the field, being dug up, and their tops removed prior to planting in said boxes;

B. stacking said boxes one above the other in a dark chamber with sufficient headroom between boxes to afford space for air circulation and headroom for the growth of shoots; and

C. regulating the environment of said chamber to maintain the relative humidity thereof in the range of about 70

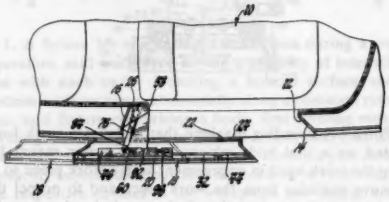
percent to 85 percent throughout the course of the forcing cycle and to hold the temperature at the start of the forcing cycle in the range of about 70° to 80° F to stimulate the initial growth of shoots, the temperature for the balance of the cycle being reduced and then held in the range of about 50° to 56° F.

3,935,674

SLIDING VEHICLE DOOR

Alverson B. Williams, Warren; Bolek J. Dolinski, St. Clair Shores, and Sam S. Pupillo, Roseville, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 15, 1974, Ser. No. 488,546
Int. Cl.² E05D 15/10
U.S. Cl. 49—212 1 Claim



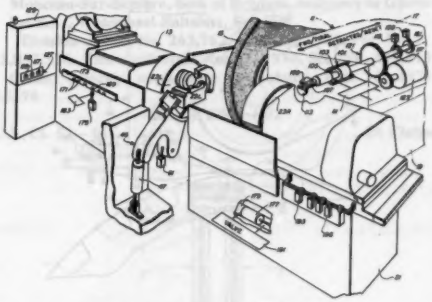
1. In a vehicle body having a door opening defined by longitudinally spaced body pillars and a door for selectively opening and closing the door opening, means for mounting the door comprising: a guard beam mounted in the door and effective to reinforce the door and transmit force applied against the door to the body pillars, the guard beam having a pair of integral longitudinally extending vertically spaced flanges at the upper and lower edges thereof, a pair of extruded carriage members, each extruded carriage member having flanges for slidably capturing the flanges of the guard beam to support the door and permit longitudinal fore and aft sliding movement of the door on the extruded carriage members between a normal position on the carriage member cooresponding to door closed position and an open position, a pair of hinge arms each being associated with one of the extruded carriage members and each having one end pivoted to one of the body pillars and the other end pivoted to the associated extruded carriage member to permit movement of the extruded carriage member and the door between a closed position closing the door opening and an open position in which the extruded carriage members are moved laterally outboard of the door opening, a first latch means acting between one of the hinge arms and the guard beam and including hook means carried on the hinge arm and slot means in the guard beam, the hook means normally extending into the slot means to lock the door from sliding movement and being withdrawn from the slot means to permit sliding movement when the hinge arm and carriage member reach their relative pivotal positions in which the carriage member and door are moved fully laterally outboard of the door opening, and second latch means acting to prevent lateral inboard movement of the door until the door has been moved on the carriage member to its normal position thereon, said latch means including a spring biased latch lever which is normally engageable in aligned apertures of one of the carriage members and its associated hinge arm to thereby prevent pivoting movement of the carriage member on the hinge arm, and an abutment mounted on the door and engageable with the spring biased latch lever to move the spring biased latch lever to its unlatched position whenever the sliding movement position of the door corresponds to the door closed position on the carriage members.

3,935,675

MACHINE TOOL FAULT INDICATOR

Ralph E. Price, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.

Continuation of Ser. No. 382,695, July 26, 1973, Pat. No. 3,839,829. This application Aug. 16, 1974, Ser. No. 497,956. The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.
Int. Cl.² B24B 5/34
U.S. Cl. 51—105 SP 14 Claims



1. A cylindrical grinder comprising
a plurality of selectively displaceable machine mechanisms,
means for sequentially operating said plurality of selectively displaceable machine mechanisms including
a corresponding plurality of means for individually displacing each of said plurality of machine mechanisms from a predetermined first position as said plurality of machine mechanisms are sequentially operated, and
means including signal generating means for selectively individually energizing said plurality of displacing means,
a corresponding plurality of means for individually signaling the completion of the selective displacement of said plurality of machine mechanisms, and
fault indicating means for identifying each and every one of said plurality of machine mechanisms which are not located at said predetermined first positions prior to the operation of said sequentially operating means comprising
a corresponding plurality of fault signal generating means,
means for sensing the presence of signals generated by each of said plurality of completion signaling means and for energizing the corresponding fault signal generating means when a signal is selectively either present or absent at each of said plurality of completion signaling means,
and means for enabling said sequentially operating means if none of said plurality of fault signal generating means are energized by said sensing and energizing means.

3,935,676

TIRE TREAD GRINDING

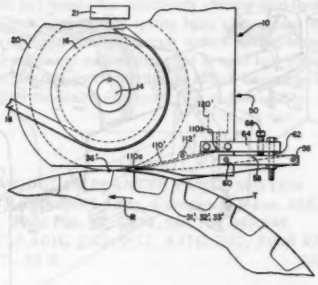
Crandall R. Kline, Jr., and Leonard A. Vandale, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 24, 1975, Ser. No. 561,138
Int. Cl.² B24B 5/00, 49/08
U.S. Cl. 51—106 R 6 Claims

1. In apparatus for grinding arc portions of a part of the width of the tread of an inflated tire wherein the apparatus includes means mounting the tire for rotation about a first axis, a grinding wheel operable to grind off material from the tread, a first mechanism for moving the grinding wheel toward and away from the tread, and a second mechanism for tilting the grinding wheel with respect to the plane of rotation of the tire to position the grinding surface of the wheel relative to the slope of said part in a plane defined by the tire axis and the grinding wheel axis,

the improvement comprising a mechanism combining a plurality of paddles each having an arcuate surface engageable with an arcuate portion of the tread from and outwardly of a line parallel and close to said plane and spanning at least one traction groove for smooth sliding engagement with said tread during rotation of the tire,

a pivot shaft having an axis parallel to the axis of the grinding wheel and carrying said plurality of paddles for arcuate displacement about the pivot shaft axis,



a shaft mounting for adjustably fixing the location of the pivot shaft relative to the axis of the grinding wheel and to the tread, and

displacement responsive mechanism responsive to displacement of at least one of said paddles about said pivot shaft for communicating to said first mechanism a control signal effective to control said moving of the grinding wheel toward and away from the tire.

3,935,677

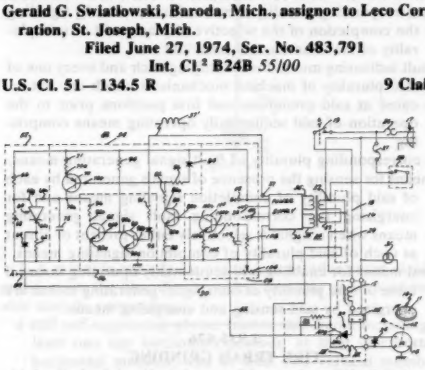
METALLOGRAPHIC POLISHER WITH SPEED CONTROL

Gerald G. Swiatlowski, Baroda, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed June 27, 1974, Ser. No. 483,791

Int. Cl.² B24B *55/00*

U.S. Cl. 51—134.5 R **9 Claims**



1. In apparatus for abrading metallographic specimens, a drive system for a movable abrasive element comprising:

electrical drive means coupled to said abrasive element for actuating of said element;

means for developing signals representative of the speed of operation of the abrasive element;

a speed control circuit coupled to said developing means for providing selectable speed control signals;

a drive control circuit coupled to said speed control circuit and to said drive means and responsive to signals from said speed control circuit to actuate and maintain said drive means at a selectable speed; and

a speed limit control circuit coupled to said developing means and to said drive control circuit to deactuate said drive means only in the event the speed of said abrasive element exceeds a preselected speed by more than a predetermined amount.

3,935,678

VACUUM ATTACHMENT FOR ABRADING MACHINE

Miksa Marton, 3620 Rankin St., Winsor, Ontario, Canada

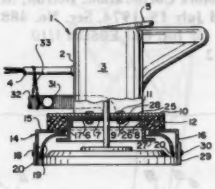
Continuation of Ser. No. 304,412, Nov. 7, 1972, abandoned.

This application Nov. 18, 1974, Ser. No. 524,799

Claims priority, application Canada, Aug. 2, 1972, 148535

Int. Cl.² B24B *23/02, 55/06*

U.S. Cl. 51—170 T **19 Claims**



1. For a dry abrading machine that includes a work head mounted on a tool body which includes motor means for driving the work head in engagement with a work piece so as to remove particles from the work piece and to propel the removed particles outwardly of the work head, generally parallel to the surface of the work piece which is being addressed,

a vacuum attachment, comprising:

a ring member incorporating an annular hollow chamber having a vacuum inlet conduit extending therefrom;

means defining a perimetrically extending series of individual apertures through the ring member, communicating the hollow chamber with the inner side of the exterior of the ring member, above the lowermost extent of the ring member;

an outer peripheral skirt of downwardly projecting scrubbing elements secured to the ring member so as to extend at least as low as the lowermost extent of the ring member, radially outside the communication of the apertures with the inner side of the exterior of the ring member, and disposed for scrubbing contact with the workpiece, to free particles which have been abraded from the work piece by the work head and to confine such particles so as to substantially prevent their escape until they are sucked up by said attachment;

retaining plate means including: a first portion having means thereon for securement thereof to the tool body; a second portion for extending generally axially from the first portion toward the work head, when the first portion is secured to the tool body; and a third, generally laterally extending portion;

said ring member including a generally radially extending portion;

a ring of resilient material generally coaxially received between the tool body and said generally radially extending portion of the ring member, the ring member radially extending portion being generally coaxially received between the ring of resilient material and said third, generally laterally extending portion of the retaining plate means;

the ring member generally radially extending portion lying radially adjacent the second portion of the retaining plate means, with radial spacing therebetween,

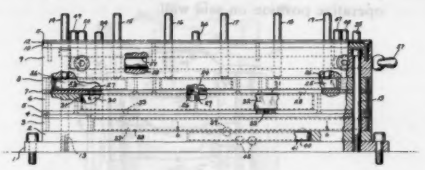
whereby, when the attachment is mounted on the tool body, the ring member is disposed for limited axial and rocking movement to maintain the apertures spatially oriented to suck in said particles which have been abraded for the work piece and propelled outwardly of the work head or freed by the scrubbing contact of said scrubbing elements with the work piece.

3,935,679

GRINDING FIXTURE

Bruno E. Peter, Milwaukee, Wis., and Reinhardt R. Deetken, Holly, Mich., assignors to Grede Foundries, Inc., Milwaukee, Wis.

Filed July 22, 1974, Ser. No. 490,344
Int. Cl.² B24B 41/06
U.S. Cl. 51—239 15 Claims



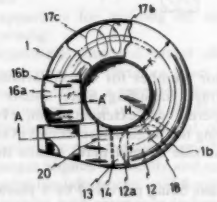
1. A fixture for supporting a workpiece during a working operation, said workpiece having a plurality of internal cavities with each cavity including a bottom surface and said bottom surfaces lying substantially along a common reference line, said fixture comprising a body, first leveling means for leveling the workpiece in a first direction, said first leveling means including a series of first axially movable pins extending upwardly beyond the body and disposed to be received within the respective cavities in the workpiece and engage the bottom surfaces, said first leveling means also includes a first balancing member fulcrumed with respect to the body, a pair of said first pins being engaged with the ends of said first balancing member on either side of the fulcrum, whereby axial movement of said first pins when the first pins engage said bottom surfaces can cause tilting of said first balancing member about said fulcrum, second leveling means for leveling the workpiece in a second direction generally normal to said first direction, said second leveling means including a series of second axially movable pins extending upwardly beyond said body and disposed to engage the lower surface of said workpiece, and locking means for locking the workpiece against movement with respect to the fixture after said first and second leveling means have leveled the workpiece in said first and second directions, respectively.

3,935,680

METHOD FOR VIBRATORY FINISHING WORKPIECES UNDER HEAVILY COMPRESSED CONDITION

Hisamine Kobayashi, Nagoya, Japan, assignor to Shikishima Tipton Mfg. Co., Ltd., Nagaoya, Japan

Division of Ser. No. 351,966, April 17, 1973. This application May 14, 1974, Ser. No. 469,888
Claims priority, application Japan, Apr. 17, 1972, 47-38474
Int. Cl.² B24B 1/00, 31/06
U.S. Cl. 51—313 5 Claims



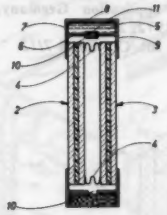
1. A method for vibratory finishing of workpieces under heavy compression during vibration, comprising vibrating a mass including workpieces and abrasive media for causing the mass to flow in a helical motion along an annular path the cross-section of which is closed throughout the annular length thereof while gradually expanding the cross-sectional area of the path from the start of the path toward the central portion of the annular length thereof and gradually decreasing the cross-sectional area toward the end of the path so that workpieces and abrasive media are caused to move in an increasing closingly spaced relation during their vibration toward the end of the path rather than be free during every vibrating cycle.

3,935,681

FIRE SCREEN FOR A STRUCTURAL PANEL

Jean-Pierre Voiturier, Gerpinnes, and Francis Jacquemin, Monceau-Sur-Sambre, both of Belgium, assignors to Glaverbel S.A., Watermael-Boitsfort, Belgium

Division of Ser. No. 263,762, June 19, 1972, Pat. No. 3,837,126. This application Aug. 7, 1974, Ser. No. 495,513
Claims priority, application Luxemburg, June 18, 1971, 63370
Int. Cl. E04b 1/92
U.S. Cl. 52—1 20 Claims



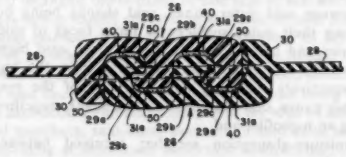
1. A fire screen for a light transmitting structural panel comprising means for providing at least one body of material capable of screening a structural panel against fire, means for retaining said fire screening means in an inoperative position in the vicinity of the periphery of the structural panel, and means responsive to a rise to a predetermined temperature for releasing said fire screeing means from its inoperative position into an operative position in which at least one fire screening body of material covers substantially the area of the panel, said fire screening means comprising a plurality of substances disposed apart from each other in the inoperative position.

3,935,682

CLEANING FASTENERS

Harold Graves Simpson, Oklahoma City, Okla., assignor to Star Manufacturing Company, Oklahoma City, Okla.

Filed Feb. 25, 1974, Ser. No. 445,498
Int. Cl.² E04D 3/363
U.S. Cl. 52—105 10 Claims



1. A construction system comprising:

at least first and second panels each having at least first and second edges and being of a geometric shape adapted for assembly in a contiguous, aligned relationship with a first edge of one panel in abutting relationship with the second edge of the adjacent panel;

each of said panels being provided with a sheet of membrane material adhering to one surface of the panel; and

coacting fasteners carried on each sheet along adjacent edges of said panels, said fasteners adapted to engage to

provide a substantially continuous exterior seal between adjacent panels, each of said coacting fastener apparatus including a fastener body having coupling means arranged to include a dirt cavity when two such fastener apparatus are coupled together, so that when said apparatus are engaged and coupled together each coupling means wipes along the other coupling means to push dirt thereon into said dirt cavity and each of said fasteners further including an indicator means for providing a distinctive visual indication adjacent fasteners are not at least substantially fully engaged.

3,935,683

MULTIPANE WINDOW STRUCTURE

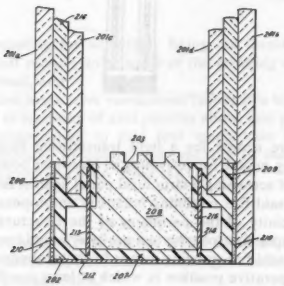
Paul Derner, Gelsenkirchen, and Paul Weigt, Oberhausen, both of Germany, assignors to Flachglas Aktiengesellschaft Delog-Detag, Gelsenkirchen, Germany

Filed Nov. 7, 1973, Ser. No. 413,525

Claims priority, application Germany, Nov. 7, 1972, 2254426; Dec. 19, 1972, 2262040

Int. Cl.² E06B 7/12

U.S. Cl. 52—172 **4 Claims**



1. A multipane window structure comprising a pair of coextensive spaced-apart transparent outer panes;

an inner transparent pane spaced from and parallel to each outer pane and closer to the respective outer pane than to the other inner pane;

a layer of transparent sound-damping material disposed between each inner pane and the respective outer pane and filling the gap between each respective inner and outer pane;

spacer means sealingly retaining said panes relative to one another and closing the edges of said structure, said spacer means comprising a generally U-section body having a pair of shanks and a bight bridging the space between said outer panes, said shanks being bounded along their outer surfaces to inner faces of said outer panes and being formed, remote from said bight, with inwardly lying channels open away from the bight and respectively receiving edge portions of the respective inner panes, said channels and said shanks together defining an h-profile; and

a moisture-absorption member received between said shanks.

3,935,684

LOADING DOCK SHELTERS

Cyril P. Frommelt, and Sylvan J. Frommelt, both of Dubuque, Iowa, assignors to Dubugue Awning & Tent Company, Dubuque, Iowa

Filed Dec. 12, 1974, Ser. No. 531,914

Int. Cl.² E06B 1/56, 7/22

U.S. Cl. 52—173 DS **10 Claims**

1. A loading dock shelter comprising

a. a head pad for extending along the top of a doorway in a warehouse wall,

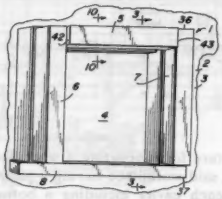
b. two side pads for extending along the sides of such a doorway,

c. means for supporting said side pads on such a wall,

d. said means comprising bracket means

1. for projecting outwardly from said wall, and

2. having outer edge portions on the side thereof remote from said wall, when said bracket means is disposed in operative position on said wall,



e. said outer edge portions having recesses therein opening outwardly away from said wall when said bracket means is disposed in said operative position, and

f. cover means for covering said bracket means and having

1. inner edge portions adapted to be disposed adjacent to said wall, and

2. other edge portions, remote from said inner edge portions and adapted to be mounted in said recesses for securing said cover means to said bracket means.

3,935,685

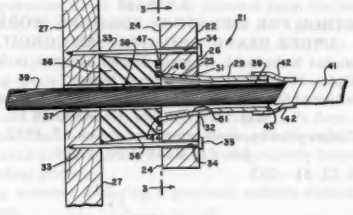
ANCHOR MEMBER AND METHOD OF FORMING SAME

George H. Howlett, Oakland, Calif., assignor to Howlett Machine Works, Berkeley, Calif.

Filed June 7, 1974, Ser. No. 477,371

Int. Cl.² E04C 3/10, 3/26; B21D 39/00

U.S. Cl. 52—223 L **10 Claims**



9. In an anchor member for use in forming a prestressed concrete anchorage including plate means formed with a convergently tapered bore extending from a front side of said plate means having the large diameter end of said bore formed therein to a rear side of said plate means the improvement comprising:

said plate means being provided by a plurality of independent abutting plates each having an opening, the openings in said plates being axially aligned and gradually decreasing in size from said front side of said plate means to said rear side of said plate means to provide said bore, and

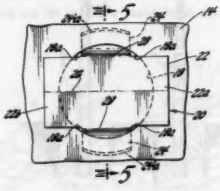
a convergently tapered tubular conduit mounted in said bore in mating relation therewith, said conduit being mounted in said bore in interference fit with said plates to secure said plates in a unitized assembly.

3,935,686

VEHICLE DRAIN HOLE PLUG

James H. Dozois, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 8, 1974, Ser. No. 458,511
Int. Cl.[2] E04F 19/08; B60J 9/00
U.S. Cl. 52—302 2 Claims



1. A drain plug for partially closing a drain hole opening in a vehicle body panel, said drain plug in the form of a cross of relatively thin material includes a first arm and a second arm at right angle to each other, the drain plug in its pre-installed form being partly folded along a central longitudinal fold line extending across said first arm to divide said first arm into an integral first arm portion and a second arm portion folded toward each other, the opposite ends of said second arm being bent adjacent to said first arm toward each other with their free end portions in a return bend in a direction opposite to each other, the extent between said free ends of said second arm in the pre-installed free form being approximately equal to the diameter of the drain hole opening whereby said second arm can be inserted through the drain hole opening, said first arm portion and said second arm portion of said first arm being movable about said fold line toward an unfolded position whereby the extent between said free ends of said second arm is increased to a length substantially greater than the diameter of the drain hole opening whereby said first arm engages one side of the body panel and the free ends of said second arm engage the opposite side of the body panel, the end surface of each of said free end portions being of a shape to provide substantially point contact between these end surfaces and the body panel.

3,935,687

PLATFORM TENNIS COURT

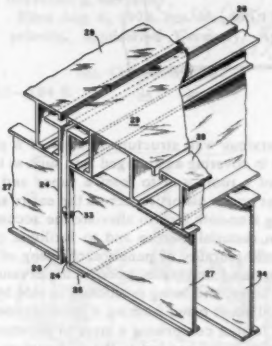
George A. Vaughn, and Richard D. Hargrave, both of Princeton, N.J., assignors to Maark Corporation, Plainsboro, N.J.

Continuation of Ser. No. 352,266, April 18, 1973, abandoned, which is a division of Ser. No. 211,028, Dec. 21, 1971, Pat. No. 3,745,729. This application Sept. 13, 1974, Ser. No. 505,796
Int. Cl.[2] E04B 5/43
U.S. Cl. 52—483 6 Claims

1. Support apparatus for residing on apparatus support members, comprising:

a pair of oppositely disposed metal channel members spaced a predetermined distance apart in the horizontal direction and extending a predetermined distance in the horizontal direction, each of said channel members being of generally E-shaped crosssectional configuration and including a plurality of integrally formed and horizontally disposed flanges aligned vertically and spaced apart vertically predetermined distances, said flanges providing said channel members with resistance to bending in the horizontal direction, the flanges formed on each channel member extending towards the flanges formed on the other channel member, the lower two flanges on each channel member for receiving the ends of metal joists therebetween, and the upper and lower flanges on each channel member defining the top and bottom of said channel members;

a plurality of vertically disposed metal joists spaced apart predetermined distances in the horizontal direction and extending between said channel members and perpendicular thereto, the ends of said joists being received between said lower two flanges formed on said oppositely disposed channel members, whereby said joists are supported upwardly of the bottoms of said channel members and whereby said bottoms of said channel members define the bottom of said support apparatus and whereby upon said support apparatus residing on said apparatus support members only said bottoms of said channel members engage said apparatus support members and said joists are elevated above said apparatus support members, and said joists being fixedly secured to said channel members;



a plurality of metal deck members spaced apart a predetermined distance in the horizontal direction and said deck members extending a predetermined distance in the horizontal direction and parallel with said channel members, said deck members residing on said joists, each of said deck members being of generally -shaped cross-sectional configuration and including a horizontal member for receiving a load applied vertically downwardly to said support apparatus and said horizontal member having a plurality of integrally formed and vertically disposed and downwardly extending legs for providing said deck member with resistance to bending in the vertical direction but allowing some deflection downwardly of said deck members upon said load being applied thereto directly over said legs, and the bottoms of said legs of said deck members being fixedly secured to the tops of said joists, the outer portion of the horizontal members of said outer deck members extending over said tops of said channel members whereby said load can be applied directly only to said deck members and upon said load being applied to said deck members directly over the tops of said channel members, said outer portions of said deck members providing at least some deflection downwardly;

said pair of channel members for providing said support apparatus with resistance to bending in the vertical direction; and

said joists for providing said support apparatus with resistance to bending in the vertical direction and upon said load being applied to said deck members directly over the points at which said legs of said deck members engage said joists said joists providing at least some downward deflection due to said elevation of said joists above said apparatus support members by said bottom flanges of said joists.

3,935,688

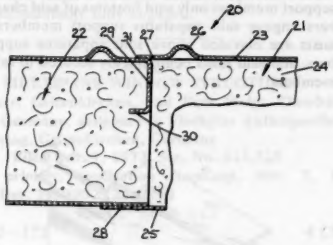
IMPERVIOUS WALL STRUCTURE

Charles Joseph Trojahn, Middle Village, and Nikolaus Friedrich, Maspeth, both of N.Y., assignors to Charles J. Trojahn, Middle Village; Friedrich Metal Products Co., Woodside and Frank Brunckhorst Co., Brooklyn, all of, N.Y.

Filed Dec. 3, 1973, Ser. No. 420,775

Int. Cl.² E04C 2/00; E04B 1/00; B23K 1/20

U.S. Cl. 52—622 6 Claims



1. An impervious wall structure formed of a plurality of panels for use in covering an enlarged area such as the interior wall surface of a room and to form a vapor and insulation barrier without undue distortion across the entire surface, the surface having a smooth face to alleviate the accumulation of contamination material thereto and to facilitate cleaning of the surface; said plurality of panels each being of thin cross section, each panel having a smooth impervious exposed metal surface layer, and being positioned in side by side relation with an adjacent panel forming a joint between panels;

each panel further comprising a layer of substantially solid insulating material bonded to the said surface layer, and a backing layer, affixed to the insulating layer distal from the surface layer;

the layers of each panel forming a male and female vertical side edge;

seating means comprising the female vertical side edge by having the surface and backing layers extending beyond the layer of insulating material thereby forming a panel receptacle for receiving the male vertical side edge;

the male side edge having the backing, insulating and surface layers in substantial vertical alignment, the male side edge being inserted into the receptacle of the female side edge bringing the surface and backing layers of adjacent panels in overlapping relationship, and the overlapping layer of metal surfacing material welded to the surface layer of the adjacent panel.

3,935,689

TRANSMISSION LINE STRUCTURE

Thomas A. Bladholm, Mound, and William T. McCalla, Brooklyn Park, both of Minn., assignors to Contran Corporation, Osseo, Minn.

Filed Apr. 1, 1974, Ser. No. 456,982

Int. Cl.² E04C 3/30

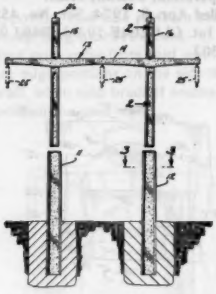
U.S. Cl. 52—722 3 Claims

1. A transmission line structure comprising, in combination:

a plurality of poles of prestressed concrete, each having a bottom end for securement to the ground and a flat top end;

a superstructure including at least one cross arm unit of prestressed concrete having a pair of spaced flat under surfaces supported from below on the flat top ends of said poles, and comprising a cross arm and at least one conductor-supporting pole extension unitary therewith and projecting upwardly therefrom;

and axially extending means rigidly securing said superstructure to the tops of said poles, including studs embedded in and extending axially from said poles, apertures in said superstructure, at the locations of said flat under surfaces, spaced for traversal by said studs, and nuts



mating with the portions of said studs which extend upward through said superstructure, and engaging said superstructure.

3,935,690

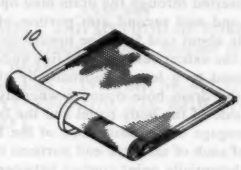
METHOD OF PACKAGING AND UNPACKAGING A SELF-INFLATING AIR MATTRESS

James M. Lea, 1207 NW. Culbertson Drive, Seattle, Wash. 98177, and John D. Burroughs, 10468 Forest Ave. South, Seattle, Wash. 98178

Filed Dec. 10, 1974, Ser. No. 531,299

Int. Cl.² B65B 63/02

U.S. Cl. 53—24 10 Claims



1. A method of packaging a self-inflating air mattress having an open cell foam core, an air impervious envelope, and an inflating valve, said method comprising:

a. rolling the air mattress in an evacuated condition into a compact rolled-up configuration,

b. placing said rolled-up mattress in a tubular container, while maintaining its evacuated condition, and

c. releasing the interior of the mattress to atmospheric pressure to cause the mattress to expand moderately to fit snugly in the container.

3,935,691

MACHINE FOR PACKAGING BOX-SHAPED ARTICLES IN BAGS

Jan Broch, Rodovre, Denmark, assignor to Schulstad Brod A/S, Glostrup, Denmark

Filed Nov. 8, 1974, Ser. No. 522,283

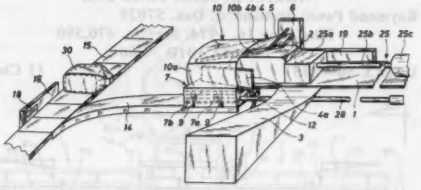
Claims priority, application Denmark, Nov. 8, 1973, 6039/73

Int. Cl.² B65B 57/10, 43/36

U.S. Cl. 53—59 R 8 Claims

1. A machine for packaging box-shaped articles such as loaves of bread in bags, said machine including a bag magazine containing a stack of bags, article feed means including pusher means mounted for reciprocation between a retracted position and an extended position for feeding the articles toward the bag magazine, spaced guide finger means for guiding the articles and bags relative to each other during insertion

of an article into the bag, a discharge conveyor for removing the bagged articles, means for reciprocating said bag magazine between a first position spaced from the guide finger means and a second position adjacent the guide finger means in which the guide finger means partially overlie the magazine, means for inflating the topmost bag in said magazine when said magazine is in said first position so that movement of said magazine to said second position causes the uppermost inflated bag of said magazine to receive the ends of said guide finger means on its interior, said feed means including power



means for operating said pusher for feeding one article at a time into the uppermost inflated bag by moving the article through the space between said spaced guide finger means into the uppermost bag when the bag magazine is in its second position following arrival of the next previously bagged article at said discharge conveyor and wherein said power means for operating said pusher means operates the pusher at a speed to move the article at a sufficient speed to cause forceful engagement of the article with the bottom of the bag to move the bag from the top of the bag magazine to the discharge conveyor.

3,935,692

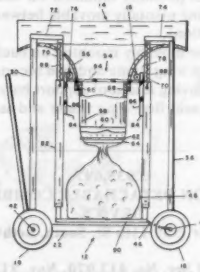
REFUSE COLLECTOR AND BAGGING DEVICE

Jack E. Miller, 6216 Imperial Key, Tampa, Fla. 33615

Continuation-in-part of Ser. No. 444,642, Feb. 21, 1974, abandoned. This application Jan. 13, 1975, Ser. No. 540,566

Int. Cl.² B65B *1/22*

U.S. Cl. 53—126 **19 Claims**



1. A refuse collector for collecting refuse, said refuse collector comprising frame means, at least one hopper means attached to said frame means, said hopper means including an upper portion having an entrance formed therein to receive the refuse and a lower portion having an exit formed therein to direct the refuse from said hopper means, retainer means formed on said lower portion to retain a refuse receptacle thereon to receive refuse directed through said hopper means, closure means disposed in operative relationship relative to said hopper means, said closure means including closure actuator means movable between a first and second position and closure element operatively interconnected to said closure actuator means to move between an open and closed position, said closure actuator means including bias means to bias said closure actuator means in said first position, said closure actuator means further including platform means to engage the refuse receptacle to move said closure actuator means from said first to said second position as a predetermined amount of refuse is placed in the refuse receptacle, said closure element coupled to said closure actuator means to move from said open to said closed position when said closure actuator means is in said second position, said closure element disposed relative to said hopper means to isolate said hopper means from the refuse to control the amount of refuse deposited in the refuse receptacle.

3,935,693

DEVICE FOR SMOOTH PRESSING SHRINK FOIL WRAPPINGS

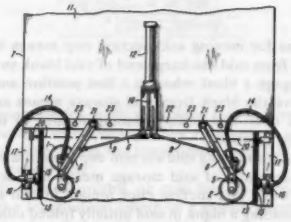
Robert Lehle, Ehningen, Germany, assignor to Karl Leibfried GmbH, Herrenberg, Germany

Filed Aug. 6, 1974, Ser. No. 495,117

Claims priority, application Germany, Aug. 9, 1973, 2340339

Int. Cl.² B65B *53/02*

U.S. Cl. 53—184 R **8 Claims**



1. In a device in which articles are enclosed in shrink foil wrapping, the device including a tunnel and conveyor chain means moveable along the tunnel for conveying articles through the tunnel from the entrance end thereof to the exit end, the improvement comprising; pressing roller means at the exit end of the tunnel for engaging the sides of wrapped articles emerging from the tunnel, said roller means being rotatable on axes perpendicular to the plane of movement of the articles, support means supporting said roller means for movement parallel to said plane, drive means connected to at least one roller of said roller means and imparting a peripheral velocity thereto on the side facing said articles substantially conforming to the velocity imparted to said articles by said conveyor chains, said drive means including a sprocket having a pitch diameter equal to the diameter of said driven roller and meshing with said chain, and a flexible drive shaft connecting the sprocket to the driven roller.

3,935,694

MACHINE FOR FORMING WRAP-AROUND SHIPPER PACKAGES

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Division of Ser. No. 434,043, Jan. 17, 1974, Pat. No. 3,879,920. This application Jan. 22, 1975, Ser. No. 542,927

Int. Cl.² B65B *41/06*

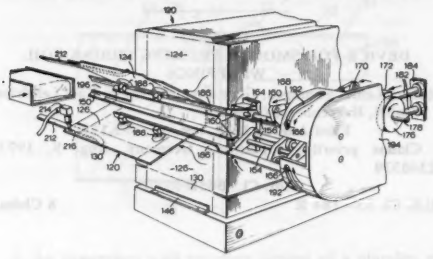
U.S. Cl. 53—389 **2 Claims**

1. In a packaging machine having a wrapping station through which a plurality of shipper package forming members pass in a wrapping path, and a carton blank storage station for storing a plurality of carton blanks each having a back panel, a front panel, a side panel connected to one side edge of said front panel and said back panels, a front side flap connected at the other side edge of said front panel and a back side flap connected at the other edge of said back panel, the improvement of

a. carton blank storage means in said carton blank storage station spaced laterally from said wrapping path and having a discharge end through which knock-down carton blanks may be removed disposed in a plane extending normal to said wrapping path,

b. initial bending former means disposed outwardly from and adjacent said discharge end of said carton storage means and aligned with and having a width substantially equal to the width of said side wall panel of a blank,

c. suction cup means for engaging said front panel and said back panel of a blank,



d. means for moving said suction cup means towards and away from said discharge end of said blank storage means to engage a blank when in a first position and thereafter remove the blank from said storage means and bend the blank over said initial bending former in moving to a second position,

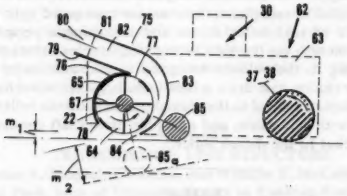
e. means for moving said suction cup means laterally of said discharge end of said storage means into said wrapping path while said suction cups remain in said second position holding a blank in said initially folded configuration.

3,935,695

NON-MARKING LAWN MOWER

Richard C. Merry, Box 153, Oakville, Ontario, Canada

Filed May 2, 1974, Ser. No. 466,162
Int. Cl.[2] A01D *35/24*
U.S. Cl. 56—13.4 **5 Claims**



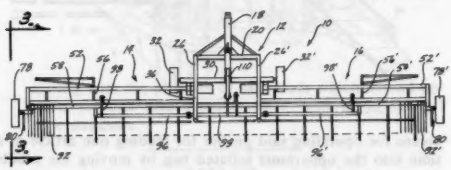
1. A lawn grass mower comprising: a rigid housing, a cutter cylinder having flying cutters thereon, said cylinder being of a predetermined length, said cylinder being rotatably supported in said housing; a mower supporting roller structure for said housing; means in said housing including shafts and bearings rotatably mounting said cylinder and said roller structure in parallel spaced apart relationship; a drive motor supported by said housing and including a drive connection for rotating said cutter cylinder at a cutter speed greater than 6,000 feet per minute in a direction moving the cutters of said reel cylinder forwardly in a grass cutting action; at least one forward adjusting roller in said mower housing adjustable to support said cylinder and the cutters thereof a selected predetermined distance above a ground surface; said cutting cylinder and flying cutters being in the form of a plurality of cutter discs of predetermined diameter; each of said discs having opposed laterally extending blades on each of the side surfaces thereof; blower members on each of the side surfaces thereof; a driving collar separating each of said discs from the next in parallel spaced apart relationship along the shaft mounting said cylinder defined by said cutter discs; and a centrifugal blower housing structure extending about said cutter cylinder to define a blower inlet opening forwardly of said adjusting roller over the ground surface and defining thereabove a blower body and discharge pipe having an opening for the discharge of grass cuttings.

3,935,696

AGRICULTURAL TOOL BAR

Raymond Pavel, Scotland, S. Dak. 57039

Filed May 16, 1974, Ser. No. 470,390
Int. Cl.[2] A01D *76/00*
U.S. Cl. 56—385 **11 Claims**



1. An agricultural tool bar comprising,

a wheeled center frame having rearward and forward ends and opposite sides,

first and second wing frames each having rearward, forward, inner and outer ends,

said first wing frame being selectively pivotally secured at its inner end, about a vertical axis, to one side of said center frame,

said second wing frame being selectively pivotally secured at its inner end, about a vertical axis, to the other said of said center frame,

said first and second wing frames being selectively pivotally movable between working and transport positions relative to the direction of travel of the tool bar,

locking means for selectively locking said wing frames in their said working position,

a rotatable wheel pivotally mounted on each of said wing frames and being pivotally movable between working and transport positions,

a tool support bar movably mounted on each of said center frame, said first wing frame and said second wing frame,

and means for moving said tool support bars relative to said center frame, said first wing frame and said second wing frame.

3,935,697

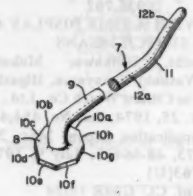
MULTIPOSITION DETACHABLE COMBINE TOOTH DEVICE

Walter David Hofer, 939 11th St. South, Lethbridge, Alberta, Canada

Continuation of Ser. No. 417,970, Nov. 21, 1973. This application Nov. 25, 1974, Ser. No. 526,974
Int. Cl.[2] A01D *77/00*
U.S. Cl. 56—400 **10 Claims**

1. A combine detachable tooth device comprising in combination: a combine tooth having a central shaft and having a base flange extending transversely laterally to and unitarily continuous with the central shaft, the central shaft extending axially and being shaped to include a bend at a point intermediate of the shaft's axial length at a location in juxtaposition to and spaced a predetermined distance from and above the base-flange dividing the central shaft into a proximal portion of predetermined short length and a distal portion of predetermined long length, such that the distal portion of the shaft extends substantially laterally angularly from the proximal portion of the shaft; a semi-flexible base-strip element having

upper and lower substantially flat faces extending in substantially parallel planes to one-another defining a through-space hole therethrough of a size and shape receivable of said proximal portion and further defining continuous with the through-space hole a narrowed open-ended slot of a width of predetermined width distance less than a narrowest diameter of the proximal portion such that the shaft may be pressed laterally



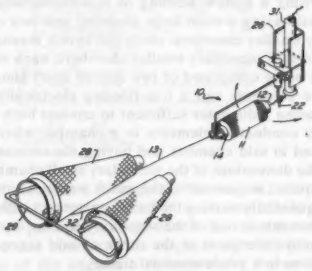
through the narrowed open-ended slot to snap into the through-space hole, the base-strip element including attaching means for mounting thereof on a combine belt's upper face such that the base-flange is insertable beneath said lower face between the lower face and the combine belt's upper face when the base-strip element is mounted on the combine belt's upper face.

3,935,698

YARN COMBINING METHOD AND DEVICE

Jack Vender Lesnik, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 2, 1975, Ser. No. 537,982
Int. Cl.² D02G *3/36*; B65H *81/08*
U.S. Cl. 57—18 **10 Claims**



1. In a device for combining a first yarn and a second yarn, the combination of:

a yarn holder adapted to hold first yarn wound thereon, said yarn holder having an axial passage for travel therethrough of a second yarn delivered from a yarn package spaced apart from said yarn holder;

guide means at the exit end of said yarn holder for guiding said first yarn to engagement with said second yarn whereby said first yarn is wrapped about and carried by said second yarn as said first yarn unwinds from said yarn holder; and

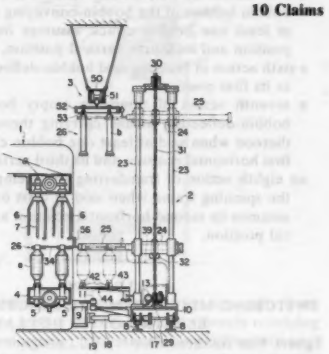
support means supporting said yarn holder, said support means being adapted to pivot with said yarn holder about said guide means whereby said yarn holder aligns itself with the angle of delivery of said second yarn to said yarn holder.

3,935,699

DOFFING APPARATUS FOR SPINNING FRAME

Makoto Iida, Chigasaki, and Akira Kuroda, Osaka, both of Japan, assignors to Toshiba Seiki Kabushiki Kaisha and Kanebo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Dec. 12, 1974, Ser. No. 532,292
Claims priority, application Japan, Dec. 13, 1973, 48-139935
Int. Cl.² D01H *9/08*
U.S. Cl. 57—52 **10 Claims**



1. An apparatus for doffing bobbins for a spinning frame having a plurality of bobbin spindles arranged, at a predetermined equal pitch, along the longitudinal length of said spinning frame, comprising:

a movable frame movable on rails laid on a floor surface along the longitudinal length of a spinning frame,

pillars extending from said movable frame,

bobbin-chucking means vertically slidably carried on said pillars and having a horizontally movable arm and having at least one bobbin chuck at the forward end of this movable arm,

bobbin-deflecting means movably arranged on said movable frame for moving between a first position located just below said at least one bobbin-chuck and a second position located away from said first position when viewed from thereabove, and

bobbin-conveying means movable on a fixed rail provided above said bobbin-chucking means along the longitudinal length of the spinning frame, and having a plurality of bobbin holders suspended in row from supporting means provided thereon,

said bobbin-chucking means being displaceable horizontally between a first horizontal position corresponding to the position of one of said bobbin holders and a second horizontal position located at a bobbin carried on the spinning frame, and at the same time being displaceable vertically between a third vertical position corresponding to the upper end portion of the bobbin carried on the spinning frame and a fourth vertical position corresponding to the upper end portion of the bobbin suspended from said one of the bobbin holders, to assume such a position at a time as is defined by any one horizontal position plus any one vertical position selected from the above four positions;

said apparatus being arranged to perform the following eight sequential interlocked actions as one cycle of the doffing operation:

a first action of removing empty bobbins from said bobbin holders of said bobbin-conveying means when said at least one bobbin chuck assumes its first horizontal position and its fourth vertical position,

a second action of transferring these empty bobbins onto said bobbin-deflecting means when said at least one bobbin chuck assumes its first horizontal position and its third

vertical position and when said deflecting means assumes its first position,

a third action of deflecting the position of said bobbin-deflecting means into its second position,

a fourth action of catching the full bobbins from the spinning frame when said at least one bobbin chuck assumes its second horizontal position and its third vertical position,

a fifth action of transferring these full bobbins onto the bobbin holders of the bobbin-conveying means when said at least one bobbin chuck assumes its first horizontal position and its fourth vertical position,

a sixth action of bringing said bobbin-deflecting means back to its first position,

a seventh action of removing empty bobbins from said bobbin-deflecting means carrying these empty bobbins thereon when said at least one bobbin chuck assumes its first horizontal position and its third vertical position, and

an eighth action of transferring these empty bobbins onto the spinning frame when said at least one bobbin chuck assumes its second horizontal position and its third vertical position.

3,935,700

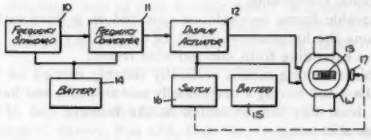
SWITCHING MECHANISM FOR ELECTRONIC WATCH ELECTRO-OPTIC DISPLAY

Egbert Van Haaften, Closter, N.J., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Nov. 6, 1973, Ser. No. 413,370

Int. Cl.² G04B *19/24, 27/00*

U.S. Cl. 58—4 A **6 Claims**



1. A battery-operated electronic watch formed by a self-contained cased module having three exposed terminals and having an electro-optic digital time display, the first terminal being connected through said battery to said case which represents ground, said time display having a first time-of-day display state which is presented when the second terminal is grounded, a second state presenting seconds when the second and third terminals are grounded, and a third calendar date state when the third terminal is grounded, and a switching mechanism for selectively enabling any one of the three states, said switch mechanism comprising:

A. a crown and stem assembly which is supported for axial movement, said stem having a narrow annular groove and a broad annular groove axially spaced from the narrow groove and disposed adjacent the free end of the stem,

B. a resilient strap connected at one end to ground, the other end of said strap having a notch therein which accommodates said narrow groove whereby said strap maintains said stem in a neutral position and connects said stem permanently to ground,

C. a flat spring contact extending into the broad groove and spaced from the rear and front shoulders formed on either side of the broad groove when the stem is in its neutral position, the flat spring contact being connected to the third terminal, and

D. a flat resilient element connected to the second terminal, the end portion thereof being spaced from the free end of the stem in the neutral position whereby when the stem is pushed in part way, its free end engages the end portion of the element to effect a connection only to said second terminal thereby grounding only said second terminal, when it is pushed in fully, the rear shoulder of said broad groove also engages the falt spring contact to effect a simultaneous engagement with the third terminal thereby simultaneously grounding said third terminal, and when it is pulled out, the front shoulder of said broad groove engages the flat spring contact to effect a connection only with the third terminal thereby grounding only said third terminal.

3,935,701

WRISTWATCH WITH A TIME DISPLAY CONTROL SWITCH MEANS

Masamichi Yamauchi, Ichikawa; Makoto Yoshida, Tokorozawa, and Yasuaki Nakayama, Higashi-kurume, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1974, Ser. No. 454,481

Claims priority, application Japan, Mar. 26, 1973, 48-34375; June 13, 1973, 48-66485; July 9, 1973, 48-77315; July 6, 1973, 48-79763[U]

Int. Cl.² G04B *19/34*

U.S. Cl. 58—50 R **1 Claim**

1. An electronic watch comprising an illuminatable time display unit, control means for controlling the energization of said display unit including a switching unit, said switching unit comprising a hollow housing of non-electrically conductive material having a main large chamber and two opposed secondary smaller chambers, electrical switch means disposed in each of said secondary smaller chambers, each of said switch means being comprised of two spaced apart electrically conductive elements and a free-floating electrically conductive ball having a diameter sufficient to contact both of said electrically conductive elements in a chamber when said ball is disposed in said chamber and having dimensions slightly less than the dimensions of the secondary small chambers whereby a controlled movement of the watch wearer's wrist is required for sequentially moving the ball from contact with the conductive elements in one of the secondary smaller chambers to the conductive elements in the other of said secondary smaller chambers in a predetermined time.

3,935,702

INVERTIBLE TIMER

Koji Tamada, 705 Yamate Mansion, 81 Nakaodai, Naka, Yokohama, Kanagawa, Japan

Filed Dec. 5, 1973, Ser. No. 421,914

Claims priority, application Japan, Dec. 8, 1972, 47-140382; Feb. 5, 1973, 48-14795; Nov. 2, 1973, 48-127397

Int. Cl.² G04F *1/06*

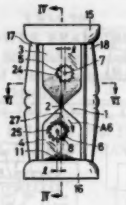
U.S. Cl. 58—144 **3 Claims**

1. An invertible timer comprising a closed vessel having upper and lower chambers divided by a throttle portion, each chamber enclosing a substantial amount of granular material, said invertible timer being characterized by:

A. said closed vessel being filled with liquid;

B. an opaque plate overlying the rear side of said closed vessel;

C. a turn wheel rotatable in each of the upper and lower chambers of said closed vessel; and



D. resilient sealing members at the ends of said closed vessel.

3,935,703

FUEL CONTROL SYSTEM FOR GAS TURBINE ENGINE

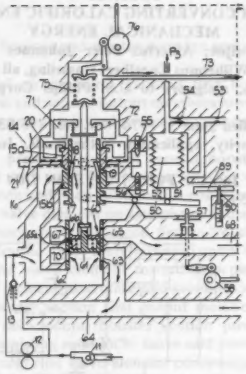
Trevor Stanley Smith, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 18, 1974, Ser. No. 489,754

Claims priority, application United Kingdom, July 18, 1973, 34134/73; July 18, 1973, 34137/73

Int. Cl.² F02C 9/10

U.S. Cl. 60—39.28 R 12 Claims



1. A fuel control system for a gas turbine engine, comprising a pump, a variable metering device downstream of said pump, first and second passages through which the downstream side of said device can communicate respectively with pilot and main burners of the engine, a throttle valve between said device and said second passage, said throttle valve being urged open by the pressure downstream of said metering device and urged shut by the pressure in said second passage, biasing means urging said throttle valve against said downstream pressure, means, responsive to an increase in engine speed, for reducing the bias applied to said throttle valve and means, operable during engine starting, for reducing said bias.

3,935,704

FAN PROPULSOR OIL ESCAPEMENT MEANS

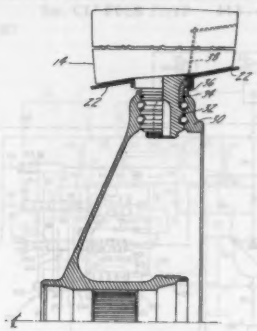
Philip E. Barnes, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 12, 1974, Ser. No. 505,402

Int. Cl.² F02C 3/06; F02K 3/06

U.S. Cl. 60—226 R 6 Claims

2. In a ducted fan propulsor having a plurality of fan blades disposed upstream of a gas turbine engine, each of said fan blades having an inner portion including a shank in proximity to the inlet of said gas turbine engine and an outer portion in proximity to an engine bypass duct, said shank being mounted in a recess in a hub, an improvement for capturing oil escaping from said hub recess which comprises an enlarged diameter



portion on said shank spaced longitudinally outwardly from said hub recess and having an annular recess therein overlying said hub recess and passage means extending from said annular recess to said blade outer portion for venting oil collected in said annular recess to said bypass duct.

3,935,705

EXHAUST MANIFOLD FOR AN INTERNAL COMBUSTION ENGINE

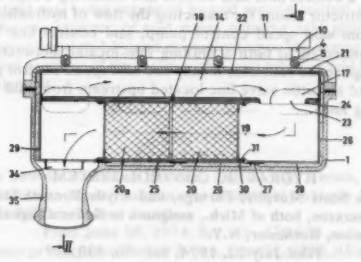
Jean René Hergoualch, Bougival, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Sept. 21, 1973, Ser. No. 399,417

Claims priority, application France, Mar. 10, 1972, 7235012

Int. Cl.² F01N 3/14

U.S. Cl. 60—302 11 Claims



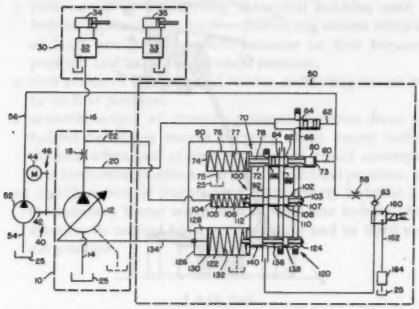
1. An exhaust manifold for an internal combustion engine comprising a housing enclosing an elongated space, a tubular member disposed in the housing containing catalytic components and having a heat insulating wall which divides the space into first and second parallel chambers extending longitudinally in the space, the second chamber being the bore of the tube and the first chamber being enclosed by a casing covered with a heat insulating material and having a substantially rectangular parallelepiped shaped cross-section, inlet means for flow of exhaust gas from the engine into the first chamber, means for adding air to the said exhaust gas upstream of the inlet means, an opening in said wall for flow of exhaust gas from the first chamber into one end of the second chamber, and means for flow of exhaust gas from the opposite end of the second chamber to an exhaust system of a vehicle.

3,935,706

HYDRAULIC CONTROL SYSTEM

Clyde Bennett Stevens, Kalamazoo, Mich., assignor to General Signal Corporation, Rochester, N.Y.

Filed July 22, 1974, Ser. No. 490,455
Int. Cl.² F16D 31/02; F04B 49/00
U.S. Cl. 60—444 16 Claims



1. In a hydraulic control system including a variable displacement pump for providing hydraulic fluid to a work function, driving means including a rotating shaft for operating said variable displacement pump, the improvement comprising:

a control circuit means connected to both said variable displacement pump and said driving means for permitting the delivery of fluid to said work function when said driving means is operating up to a predetermined speed and for stopping delivery of said hydraulic fluid to said work function when said driving means is running above said predetermined speed, said control circuit means further includes cutoff means for stopping delivery of power to said work function when said driving means is running up to said predetermined speed, wherein said control circuit means includes a speed control pump operated by said rotating shaft and connected to one end of a control line, said control line including a high speed restrictor means for restricting the flow of hydraulic fluid from said speed control pump, said control line being connected to both a limiting line located between said high speed restrictor means and said speed control pump and a shuttle valve line located upstream from said limiting line.

3,935,707

HYDRAULIC CONTROL SYSTEM

Eugene Scott Murphy, Portage, and Clyde Bennett Stevens, Kalamazoo, both of Mich., assignors to General Signal Corporation, Rochester, N.Y.

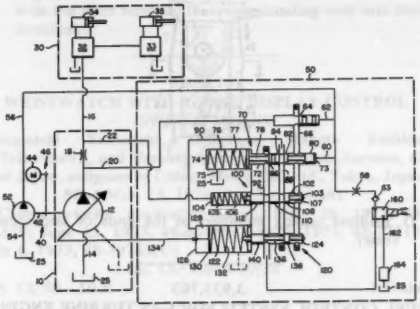
Filed July 22, 1974, Ser. No. 490,629
Int. Cl.² F16D 31/02; F04B 49/00
U.S. Cl. 60—444 36 Claims

1. A hydraulic control system including:

a generating means for providing power to a work function, including a variable displacement pump for discharging hydraulic fluid into a power line connecting said variable displacement pump to said work function;

a driving means for operating said generating means, including a rotating shaft for operating said variable displacement pump;

a control circuit means connected to both said generating means and said driving means for permitting the delivery of power to said work function when said driving means is operating up to a predetermined speed and for stopping delivery of power to said work function when said driving means is running above said predetermined speed, wherein said control circuit means includes a speed control pump operated by said rotating shaft and connected to one end of a control line, said control line including a high speed restrictor means for restricting the flow of



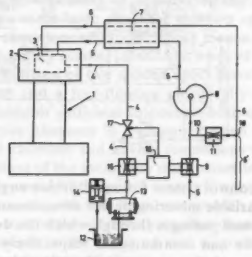
hydraulic fluid from said speed control pump; said control line being connected to both a limiting line located between said high speed restrictor means and said speed control pump and a shuttle valve line located upstream from said limiting line.

3,935,708

DEVICE FOR CONVERTING CALORIFIC ENERGY INTO MECHANICAL ENERGY

Arend Harrewijne; Albertus Peter Johannes Michels, and Franciscus Wilhelmus Engelbert Gasseling, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 475,831
Claims priority, application Netherlands, June 13, 1973, 7308176
Int. Cl.² F02G 1/04; F23N 1/04
U.S. Cl. 60—517 5 Claims



1. A device for converting calorific energy into mechanical energy, comprising at least one combustion chamber having connected thereto at least one inlet duct for fuel, at least one inlet duct for combustion air in which a first restriction is incorporated, and at least one outlet duct for flue gases, a flue gas return duct being provided having an inlet and an outlet, the inlet being connected to the flue gas outlet duct and the outlet to the part of the combustion air inlet duct which is situated between the combustion chamber and the first restriction, the flue gas return duct incorporating a second restriction which is constructed such that the mass flow of flue gas which passes through in each operating condition of the device is at least substantially proportional to the root of the pressure difference prevailing across the second restriction, characterized in that the first restriction is constructed such that the mass flow of air passing through in each operating condition of the device is proportional to the power M of the

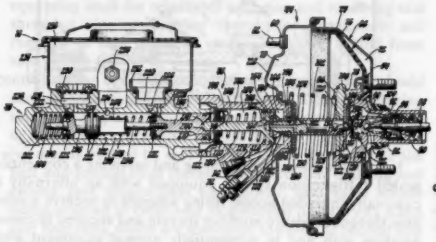
pressure difference prevailing across the first restriction, where $1 < M \leq 3/2$.

3,935,709

DUAL POWER BRAKE BOOSTER

Thomas P. Mathues, Miamisburg, and Donald L. Parker, Middletown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 441,239, Feb. 11, 1974. This application Feb. 18, 1975, Ser. No. 550,872
Int. Cl.² B60T 13/00
U.S. Cl. 60—547 4 Claims



1. A brake booster and master cylinder assembly comprising:

a differential air pressure operated first booster section having first and second output members movable as a unit under power and relatively movable under manual operation;

a hydraulic pressure operated second booster section in alignment with said first booster section and having a power piston and open center valve control means including a first valve element on said piston and a second valve element cooperable with said first valve element to restrict hydraulic flow therebetween upon movement of said second valve element toward said piston and said first valve element to actuate said second booster section;

said first booster section first output member operatively engaging said second booster section power piston in force transmitting relation to move said power piston and therefore said first valve element commensurately therewith, said first booster section second output member being operatively connected with said second valve element in force transmitting relation to move said second valve element commensurately therewith;

and master cylinder brake actuating pressure generating means actuated by movement of said power piston;

said first and second valve elements moving as a unit so long as said first booster section first and second output members move as a unit so that said second booster section is not power actuated, said second valve element moving toward said first valve element when said first booster section second output member moves relative to said first booster section first output member to power actuate said second booster section, said second valve element operatively engaging said second booster section power piston upon sufficient movement relative to said first valve element to provide a mechanical force transmitting path through said second booster section for manual operation of said master cylinder brake actuating pressure generating means;

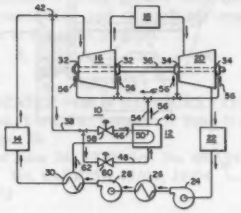
said assembly being operable to generate brake actuating pressure by sequential first booster section power operation and second booster section power operation and manual operation, and by any of said operations.

3,935,710

GLAND STEAM REHEATER FOR TURBINE APPARATUS GLAND SEALS

John D. Dickinson, Swarthmore, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 18, 1974, Ser. No. 489,637
Int. Cl.² F01B 31/10
U.S. Cl. 60—657 7 Claims



1. A gland seal system for a steam turbine power plant comprising:

a gland seal,

single steam supply means for providing steam to said gland seal, said supply means providing steam to said gland seal at a pressure and a temperature within a predetermined range of pressures and temperatures, said single steam supply means comprising

a steam source producing a predetermined volume of steam at a predetermined pressure and temperature,

a shell and tube heater element connected to said steam source,

first control means for diverting steam from said source into said tube members of said heater element, said control means regulating the pressure and the heat exchange capacity of said steam within said tube elements,

second control means diverting a portion of said steam from said source into said gland seal, said steam introduced into said gland seal passing through said shell of said heater element, the pressure of said steam entering said gland seal being regulated by said second control means, the temperature of said steam entering said gland seal being regulated by and dependent upon the temperature and pressure of the steam within said tubes of said heater element.

3,935,711

FLAP GATE

Yukio Sawai; Yoshifumi Sakurai, and Hiroshi Terata, all of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 10, 1974, Ser. No. 478,070
Claims priority, application Japan, June 15, 1973, 48-67895
Int. Cl.² E02B 7/40
U.S. Cl. 61—25 1 Claim

1. For closing the partially submerged entrance opening of a dock or the like, having opposite sidewalls, a bottom and a bank wall extending down from the bottom, a flap gate structure, comprising:

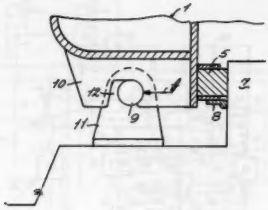
a water gate door body of closed shell structure, having when closed, a substantially rectangular vertical transverse cross-section;

a pair of fixed, horizontally extending support pins about which the door is to pivot when moving from being erected to being laid out and vice versa;

a pair of support pieces mounted on the water gate door body, each support piece having surface means defining a downwardly opening recess for receiving a respective one of said support pins;

means defining a contact surface along the bottom edge of the water gate door body, arranged for contact with the bank wall when the door is erected;

the thickness of the water gate door body being no greater than one-sixteenth times the distance between where the two support pieces receive the two support pins;



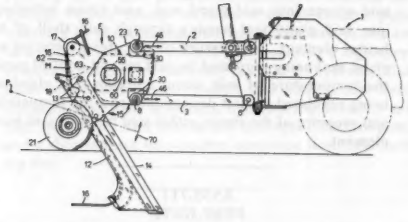
said surface means defining the recesses being so spatially arranged relative to said contact surface and the bank wall that, when the water gate door body is erected the surface means presses laterally against the respective pins on their side which is toward the bank wall, to prevent the contact surface from separating from the bank wall.

3,935,712

CABLE LAYING VIBRATORY PLOW ASSEMBLY

Robert W. Erickson, and John F. Lindell, both of Newton, Iowa, assignors to Koehring Company, Milwaukee, Wis.

Filed Jan. 16, 1975, Ser. No. 541,527
Int. Cl.² A01B *11/00*; F16L *1/00*
U.S. Cl. 61—72.6 7 Claims



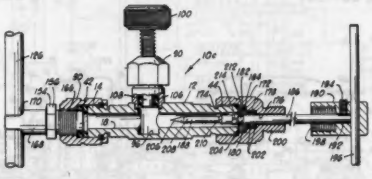
1. A vibratory plow assembly including a plow frame, a plow blade extending downwardly and forwardly from said frame and in respect to the direction of travel of said plow assembly and for forming a slit in the ground, ground engaging means for supporting said assembly, a pair of power driven counter rotating eccentric weights on said plow frame, said weights being rotatable about transverse horizontal axes which are spaced apart in the direction of travel of said plow to thereby position one weight rearwardly of the other, and a weight mass on the rear end of said plow frame; beam means for connecting said assembly to a tractive vehicle, first means for pivotably connecting said plow frame to said beam means, and second means for pivotably connecting said beam means to said tractive vehicle, said first means including elastomeric isolation mounts, whereby a pivot point for said plow frame is established rearwardly of said assembly and about which point the plow blade swingably vibrates in an upward and forward stroke.

3,935,713

METHOD AND APPARATUS FOR MAINTAINING AND SERVICING A PRESSURIZED REFRIGERATION SYSTEM OR THE LIKE

John W. Olson, Oklahoma City, Okla., assignor to C & D Valve Manufacturing Company, Oklahoma City, Okla.

Division of Ser. No. 378,920, July 13, 1973, Pat. No. 3,840,967, and a continuation-in-part of Ser. No. 484,298, June 28, 1974, Pat. No. 3,875,756, and a continuation-in-part of Ser. No. 343,512, March 21, 1973, abandoned. This application Feb. 26, 1975, Ser. No. 553,446
Int. Cl.² F25B *45/00*
U.S. Cl. 62—77 18 Claims



1. A tool for use in maintaining and servicing a conventional sealed refrigeration system equipped with an internally and externally threaded access fitting adapted to receive a removable threaded closure member therein and secured in communication with and in substantially normal alignment with a penetrable wall of the sealed refrigeration system, comprising:

a body member having a first end, a second end and having a longitudinal passageway extending therethrough communicating at the opposite ends thereof with the first and second ends of the body member;

coupling means carried on the first end of said body member for removably connecting the first end of said body member to said access fitting with one end of said longitudinal passageway in sealing communication with the access fitting;

first removable cap means securable to the second end of said body member for sealing closure of the opposite end of said longitudinal passageway and, alternately, for removal from said body member, and including an aperture formed therein substantially coaxial with the longitudinal passageway;

an externally threaded surface formed on said first removable cap means remote from the second end of said body member and coaxial with the aperture formed therein;

a first operating shaft having a first end and a second end and extending through said aperture in said first removable cap means, with the first end thereof disposed within said longitudinal passageway and with the second end thereof disposed outside said longitudinal passageway;

means carried by said first removable cap means for providing sliding and rotatingly sealing engagement between said aperture in said first cap means and said first operating shaft so that said first operating shaft may be moved axially and rotatably within said longitudinal passageway;

a substantially conical point formed on the first end of said first operating shaft for penetrating the penetrable wall of said sealed refrigeration system to open the interior of said sealed refrigeration system to the interior of said access fitting;

control means operatively engaging the second end of said first operating shaft for threadedly engaging the external threads of said first removable cap means and for rotating and axially displacing said substantially conical point within said longitudinal passageway and the interior of said access fitting in response to stimulus external thereto;

second removable cap means securable to the second end of said body member in alteration with said first removable cap means for sealing closure of the opposite end of said longitudinal passageway and, alternately, for removal

from said body member, and including an aperture formed therein substantially coaxial with the longitudinal passageway;

a second operating shaft having a first end and a second end and extending through said aperture in said second removable cap means, with the first end thereof disposed within said longitudinal passageway and with the second end thereof disposed outside said longitudinal passageway;

means carried by said second removable cap means for providing slidingly and rotatingly sealing engagement between said aperture in said second cap means and said second operating shaft so that said second operating shaft may be moved axially and rotably within said longitudinal passageway;

engaging means secured to the first end of said second operating shaft for releasably engaging and retaining said threaded closure member therein for installation and removal of said threaded closure member in and from said access fitting;

control means operatively engaging the second end of said second operating shaft for rotating and axially displacing said engaging means within said longitudinal passageway in response to stimulus external thereto;

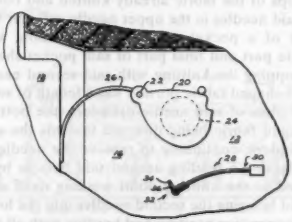
valve means carried by said body member intermediate the first and second ends thereof for alternately opening and closing said longitudinal passageway, said valve means being adapted to close said longitudinal passageway when said operating shafts are displaced toward the second end of said body member; and

actuating means operatively engaging said valve means for moving said valve means between a position opening and closing said longitudinal passageway in response to stimulus external thereto.

3,935,714
TEMPERATURE CONTROL SYSTEM OF A REFRIGERATOR-FREEZER

Samuel J. Woolley, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 29, 1975, Ser. No. 545,010
Int. Cl.² F25D *17/04*
U.S. Cl. 62—187 **5 Claims**



1. In a household refrigerator-freezer having a fresh food compartment, a fresh food compartment access door, a freezer compartment, and a partition separating the fresh food compartment from the freezer compartment, the improvement comprising:

an air passageway having an inlet and an outlet, said passageway extending through the partition for the passage of air from the freezer compartment into the fresh food compartment;

a cover plate pivotally connected to the partition and being movable between a closed position at which the cover plate is covering the air passageway and an open position at which the cover plate is spaced from at least a portion of the air passageway outlet, said cover plate being biased to the open position in response to opening the door;

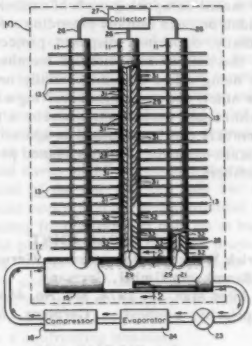
means biasing the cover plate toward the closed position in response to closing the door; and

a temperature responsive element having an end movable in response to the temperature of the fresh food compartment, said end being movable between a first position at which the end is spaced from the pathway of the cover plate in response to the temperature of the fresh food compartment being less than a preselected value and a second position at which the end is in the pathway of the cover plate in response to the temperature of the fresh food compartment being greater than the preselected value for contacting and controllably maintaining the cover plate at the open position.

3,935,715
VAPOR CONDENSER FOR A REFRIGERATION SYSTEM

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 26, 1974, Ser. No. 483,194
Int. Cl.² F25B *43/04*, *39/04*
U.S. Cl. 62—475 **1 Claim**



1. In a refrigeration system where refrigerant flows through a vapor compression refrigeration cycle having, in closed series flow relationship and in the order named, an evaporator, a compressor, a vapor condenser and an expansion device, the refrigerant flowing in its vapor state from the evaporator and through the compressor to the condenser wherein it is condensed to refrigerant condensate for delivery to the expansion device, the vapor condenser comprising:

a cylindrically-shaped horizontal header;

a plurality of air-cooled, cylindrically-shaped, generally vertical condensing tubes extending upwardly from and communicating with said header;

an inlet for said header for receiving the refrigerant vapor from the compressor and for supplying it to the lower ends of said condensing tubes, the refrigerant vapor flowing upwardly through said condensing tubes and forming, on the tubes' internal surfaces, the refrigerant condensate which then flows downwardly into said header;

a cylindrically-shaped outlet extending into the lowest portion of said header and open along its bottom for deriving the refrigerant condensate from said header and for supplying the refrigerant condensate to the expansion device;

and purging means, including a common collector and a plurality of capillary type tubes each of which vents the upper end of a respective one of said condensing tubes to said common collector, for removing any non-condensible components from the refrigerant vapor, and non-condensible components being released into the atmosphere from said common collector.

3,935,716

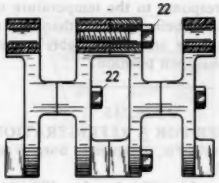
SHAFT COUPLING

Heinz-Georg Symann, Dortmund-Brackel, Germany, assignor to Kupplungstechnik GmbH, Rheine, Germany

Division of Ser. No. 252,226, May 11, 1972, abandoned. This application June 28, 1974, Ser. No. 484,337

Int. Cl.² F16D 3/78

U.S. Cl. 64—13 5 Claims



1. Means for coupling a drive shaft to a driven shaft comprising a plurality of resilient, circular members and means forming said circular members one to the other and to said shafts, said means comprising each of said circular members being provided on each radially extending side thereof with a pair of radially, oppositely disposed projections extending parallel to the axis of said circular member, said pairs of projections being offset circumferentially one pair with respect to the other, and means for receiving a fastening means disposed within said projections whereby a plurality of said circular members can be mounted in spaced relationship by fastening means extending through aligned projections of said circular members.

3,935,717

UNIVERSAL JOINT

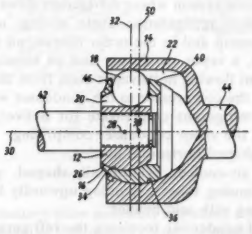
Hans-Heinrich Welschof, Obertshausen, Germany, assignor to Lohr & Bromkamp GmbH, Germany

Filed Mar. 25, 1974, Ser. No. 454,172

Claims priority, application Germany, Mar. 26, 1973, 2314904

Int. Cl.² F16D 3/30

U.S. Cl. 64—21 12 Claims



1. A universal joint having a minimum radial thickness dimension and a maximum torque transmitting capacity comprising spherically nested inner coupling, cage, and outer coupling members, said inner and outer coupling members having ball grooves therein, said cage having windows between the ball grooves, balls carried in a common plane by the windows of said cage and connecting said inner and outer coupling members in torque transmitting free tilting relation, the tilting centers of the inner and outer coupling members lying on opposite sides of the plane of the balls in said cage, said cage tapering from a thick end to a thin end to fill the radial space between the inner and outer coupling members, and radial lugs projecting from the thin end of the cage at the centers of the windows to increase the guide surfaces of the balls at the thin end of the cage and to strengthen the cage.

3,935,718

METHOD FOR MANUFACTURING STOCKINGS, SOCKS AND THE LIKE

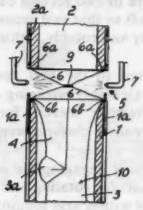
Amos Carminati, Via Crevatini, 16/A, Muggia (Trieste), and Alberto Bienati, Via Matteotti, 23, Trieste, both of Italy

Continuation-in-part of Ser. No. 141,902, May 10, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 418,167

Claims priority, application Italy, May 14, 1970, 24642/70

Int. Cl.² D04B 9/10, 9/56

U.S. Cl. 66—9 R 1 Claim



1. A method for manufacturing stockings, socks and like fabrics and closing the toe thereof on a circular knitting machine including an upper and a lower needle cylinder, wherein the fabric is taken up through the lower needle cylinder, the method comprising the steps of knitting the leg and foot portion of the fabric on the needles in both needle cylinders by selecting the needles in a manner such that the areas of said portions having right stitches on the outside of the finished fabric are knitted on the needles in the upper needle cylinder as reverse stitches and the areas of said portions having reverse stitches on the outside of the finished fabric are knitted on the needles in the lower needle cylinder as right stitches, the heel being knitted on the needles in the lower needle cylinder; effecting a 1 : 1 selection of the needles for manufacturing the toe, thereby dividing the needles in first and second needles, and bringing the first needles in the lower needle cylinder and the second needles in the upper needle cylinder with the loops thereon; lowering the first needles in said lower needle cylinder in an inoperative position, where they retain relative loops of the fabric already knitted and continuing to knit with said needles in the upper needle cylinder forming an initial part of a pocket-shaped fabric portion, knitting an intermediate part and final part of said pocket shaped fabric portion; stopping the knitting with said second needles when said pocket-shaped fabric portion has a length of substantially twice the radius of said needle cylinders, the bottom of said pocket shaped fabric being directed towards the axis of said needle cylinders; continuing to revolve the needle cylinders, thereby effecting a binding around said bottom by means of the yarn fed to the knitting point winding itself around said bottom; and bringing the second needles into the lower needle cylinder in operative position and knitting with all the needles in the lower needle cylinder, whereby the final part of said pocket-shaped fabric portion is interknitted with the initial part thereof and with said foot portion of the fabric.

3,935,719

RECIRCULATING

Raymond G. Henderson, Mount Prospect, Ill., assignor to A-T-O Inc., Willoughby, Ohio

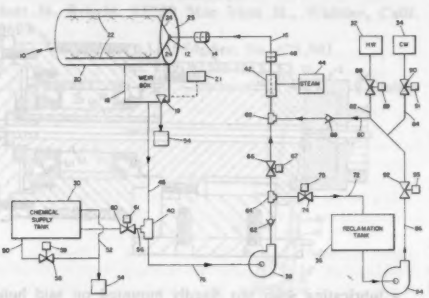
Filed Aug. 6, 1973, Ser. No. 386,014

Int. Cl.² D06F 39/02

U.S. Cl. 68—58 9 Claims

1. In combination with a washing machine of the type including a cylindrical drum having a central axis, mounted for rotation about said axis, and having a washing fluid inlet and a washing fluid outlet:

a recirculating pump having an inlet and an outlet;
a recirculating suction line extending from the washing machine outlet to the pump inlet;
a main inlet line extending from the pump outlet to the washing machine inlet;
a chemical supply tank having an outlet connected to said suction line such that flow to the pump inlet from the washing machine outlet will cause chemicals from said supply tank to be drawn into said pump and be thoroughly mixed with flow from said pump passing to said main inlet line;

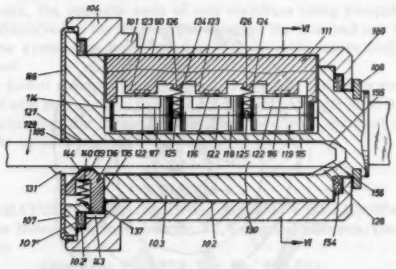


a steam heater connected to said main inlet line intermediate said pump outlet and said washing machine inlet, adapted for connection to a steam source, and arranged for heating fluid in said main inlet line during flow of said fluid from said pump to said washing machine; and,
a water supply line connected to said main inlet line intermediate said pump outlet and said steam heater and adapted for connection to a water source.

3,935,720
ROTATABLE CYLINDER LOCK

Egon Böving, Wulfrather Str. 2a, 56.6 Tonisheide, Rhineland, Germany

Filed Oct. 24, 1974, Ser. No. 517,843
Claims priority, application Germany, Oct. 25, 1973, 2353407; Feb. 6, 1974, 2405580; Mar. 21, 1974, 2413555
Int. Cl.² E05B 47/00
U.S. Cl. 70—276 11 Claims

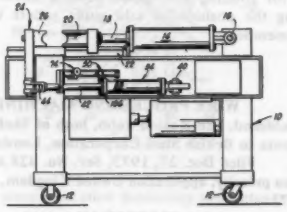


1. A lock assembly comprising:
a cylindrical housing provided with an axially extending groove on its inner peripheral wall;
a rotatable plug in said housing provided with an axially extending cavity open toward the periphery thereof, said cavity registering with said groove in a normal rotary position of said plug;
locking means in said cavity provided with biasing means urging same radially outwardly for engagement with said groove in said normal position, said groove and said locking means having complementary profiles provided with sloping flanks for camming said locking means generally radially inwardly upon incipient rotation of said plug from said normal position;
a plurality of axially spaced tumblers in said cavity independently rotatable about generally radial axes, said plug being provided with an axially extending key slot adjacent said cavity;
a key having a shank insertable into said key slot;
control means on said shank effective upon full insertion thereof to place each of said tumblers in a predetermined angular position, said locking means and said tumblers being provided with complementary formations matingly confronting one another in said angular positions but preventing inward camming of said locking means in any other position of said tumblers, said control means comprising a set of first magnets on said shank, said tumblers being provided with second magnets offset from the axes thereof attractable by said first magnets, said plug forming a thin, magnetically pervious partition between said key slot and said cavity;
a plurality of pins rising from said partition and forming bearing axles for said tumblers, said locking means comprising a bar paralleling said partition, said biasing means comprising a plurality of axially spaced compression springs interposed between said partition and said bar, said complementary formations comprising projections on said bar and recesses on said tumblers, said tumblers being disk-shaped and said recesses being located at the disk peripheries thereof, the axes of said tumblers lying in an axial plane of said plug perpendicular to said partition, said projections being offset from said axial plane, said groove and said bar having generally trapezoidal cross-sections with radially outwardly converging sides, the width of said cavity slightly exceeding the major base of the trapezoid of the bar whereby said bar is limitedly tiltable in said cavity, said bar being provided with lateral teeth extending from said major base on at least one side of said axial plane and bracketing said projections, said teeth being longer than said projections and being brought into contact with an adjoining cavity wall by a tilting of said bar upon an incipient rotation of said plug blocked by nonalignment of at least one projection with a recess on a confronting tumbler.

3,935,721
TUBING BENDING MACHINE

Kenneth M. Boteler; Cecil E. Mayfield, and Vivian C. Harris, all of Oklahoma City, Okla., assignors to B & W Manufacturing Company, Inc., Oklahoma City, Okla.

Filed Feb. 28, 1975, Ser. No. 553,877
Int. Cl.² B21D 7/24
U.S. Cl. 72—22 9 Claims



1. A tubing bending machine comprising:
a die;
means for advancing the die;
shoe means positioned in the path of advance of the die and cooperating with the die to bend a length of tubing;
a hydraulic piston and cylinder assembly coupled with the shoe means for restricting the movement of the shoe means during bending of the tubing, and for returning the

shoe means to a pre-bending position, said assembly including a cylinder and including a piston rod retractable and extensible as said shoe means undergoes movement during and after bending of the pipe;

a linear scale connected to said piston rod and movable therewith relative to the cylinder of the piston and cylinder assembly;

depth of bend indicator means adjustably positionable along the linear scale to indicate a selected desired depth of bend reading thereon; and

switch means mounted on the machine in the path of movement of said depth of bend indicator means as it moves with said linear scale and piston rod.

3,935,722

ROLLER GUIDE

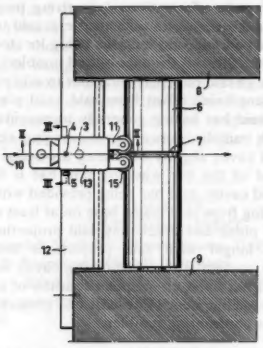
Nils-Erik Ragnar Bock, Smedjebacken, Sweden, assignor to Morgardshammar Aktiebolag, Smedjebacken, Sweden

Filed Dec. 19, 1974, Ser. No. 534,582

Claims priority, application Sweden, Dec. 20, 1973, 7317220

Int. Cl.² B21B *39/16*

U.S. Cl. 72—250 9 Claims



8. A roller guide for guiding rod or wire stock between a pair of rolling members, comprising a guide housing, means for rotatably supporting a pair or guide rollers on said guide housing for rotation about parallel axes, means for pivotally supporting said guide housing about an axis which is substantially parallel to the axis of said guide rollers and which axis extends transverse to the direction of stock movement, and means for rotating said guide housing about said axis for adjusting the position of said guide rollers relative to the rolling members.

3,935,723

WIRE PROCESSING MACHINE

Alan Fieldsend, and Ronald Jubb, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Dec. 27, 1973, Ser. No. 428,669

Claims priority, application United Kingdom, Dec. 29, 1972, 59983/72

Int. Cl.² B21C *1/04, 1/16*

U.S. Cl. 72—275 3 Claims

1. A machine for continuously processing wire drawn therethrough by a wire coiler, comprising:

a fixed mounting having a protruding boss at one end and defining a through bore and housing as one unit,

a stationary wire drawing die fixed in said housing at one end of the bore and, fixed in said housing at the other end of the bore,

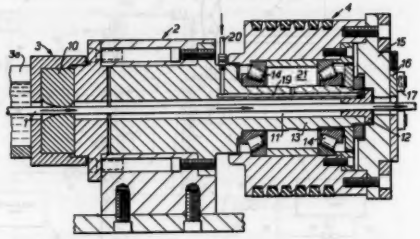
a wire guide bush,

the bore of said die and the bore of said bush being in axial alignment and in alignment with the axis of said bore,

a wire turning head rotatably mounted on said housing adjacent said wire guide bush in roller bearings carried by said protruding boss, said roller bearings being spaced apart defining a cavity therebetween,

means on said wire turning head for turning it,

a bored passage in said mounting and in said boss communicating with said cavity for conducting an atomized oil mist to said bearings, and



a lubricating soap box fixedly mounted on said housing upstream of the die for lubricating wire drawn therethrough,

a further wire guide bush and a further lubricating soap box being mounted downstream of the turning head and in axial alignment with the bore of said die and said turning head, the wire being processed by being drawn through the die and then through the turning head whereby the wire is initially die drawn and then surface turned.

3,935,724

APPARATUS FOR STRIPPING HOLLOW ARTICLES OFF A PRESS RAM

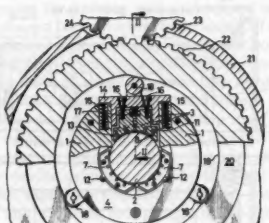
Kurt Finsterwalder, Goeppingen-Bartenbach; Karl-Heinz Philipp, Goeppingen; Martin Veil, Faurndau; Karl Widmann, Weissenstein, and Karl Zwerina, Goeppingen, all of Germany, assignors to L. Schuler GmbH, Germany

Filed July 10, 1974, Ser. No. 487,057

Claims priority, application Germany, July 28, 1973, 2338490

Int. Cl.² B21D *45/00*

U.S. Cl. 72—345 38 Claims



1. Apparatus for stripping articles from a press ram comprising:

at least one stripper having a part thereof engageable with an article on a press ram to forcibly strip the article from the press ram,

stripper support means for supporting and guiding each of said at least one strippers for movement substantially

parallel to a press ram axis of said press ram and for movement transverse to said press ram axis,

and fluid pressure medium stripper control means for applying a fluid pressure medium to each of said press ram axis to force said stripper against the article to strip the same from the press ram.

3,935,725

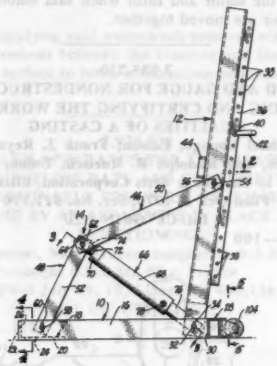
AUTOMOBILE FRAME AND BODY REPAIRING APPARATUS

Norbert M. Reischl, 13759 Mar Vista St., Whittier, Calif. 90607

Filed June 13, 1974, Ser. No. 478,981

Int. Cl.² B21D *1/12*

U.S. Cl. 72—451 **9 Claims**



1. An automobile frame and body repairing apparatus, comprising:

a horizontal T-shaped frame including a longitudinally extending stem and a cross piece at one end of said stem;

an upstanding power lever pivoted at its lower end adjacent a forward end of said frame, said lever having a bar secured to the forward side thereof, the bar having a plurality of longitudinally spaced openings therein;

means at the end of the stem opposite the cross piece for securing the frame against longitudinal movement;

means for actuating said power level, said means comprising a toggle joint having members with ends joined to form a knee, the opposite ends of said members being pivotally connected to the frame stem adjacent the rear end and to the upstanding lever intermediate its ends respectively; and

and power means connected to said frame at the lower end of said power lever and to the knee of the toggle joint for actuating said toggle joint to cause pivotal movement of the upstanding power lever.

3,935,726

APPARATUS FOR MEASURING VISCOSITY OF LIQUIDS

Werner Heinz, Dabringhauserstr. 72, Cologne-Dellbruck, Germany

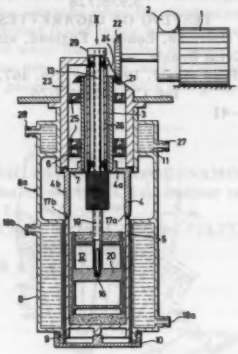
Filed June 17, 1974, Ser. No. 480,313

Claims priority, application Germany, June 18, 1973, 2330964

Int. Cl.² G01N *11/00*

U.S. Cl. 73—60 **15 Claims**

1. Apparatus for measuring the viscosity of a liquid comprising a rotatable container means; means for rotating said container means at a desired speed; a freely rotatable member within said container means, said container means and said member defining a volume therebetween for receiving liquid to be measured; a fluid bath container surrounding said container means having a fluid bath for maintaining said container means at a desired constant temperature; means for measuring torque of said member when said volume is charged with liquid to be measured and said container means is rotated by



said rotating means, and a bearing made from a material having a high thermal conductivity and located between and contacting said container means and said fluid bath container to facilitate relative rotation therebetween.

3,935,727

PRESSURE JUMP RELAXATION MEASUREMENT APPARATUS

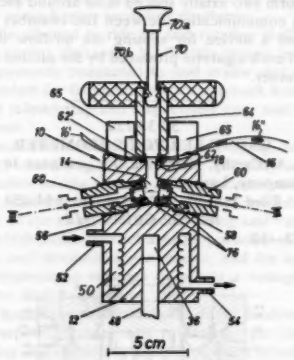
Wilhelm Knoche, Gottingen, and Gottfried Wiese, Sieboldshausen, both of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed June 21, 1974, Ser. No. 481,817

Claims priority, application Germany, July 17, 1973, 2336377

Int. Cl.² G01N *33/00*; B01J *3/04*

U.S. Cl. 73—37 **13 Claims**



11. Pressure jump relaxation measuring apparatus comprising

an autoclave body (12) forming a pressure chamber (14) having a closable opening (18);

a rupturable membrane (16) closing the opening;

two electrical measuring cells (60) facing the pressure chamber (14) and means connecting said cells to an electrical output;

wherein the measuring cells are located in the body (12) facing said chamber at a relative alignment with respect to the membrane to form an angle between 90° and 135°

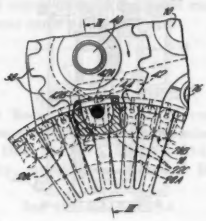
with respect to a plane transverse to the membrane closing said opening.

3,935,728

TESTING OF CIGARETTES

Eryk Stefan Doerman, London, England, assignor to Molins Limited, Great Britain

Filed May 7, 1974, Ser. No. 467,777
Int. Cl.² G01M 3/26
U.S. Cl. 73—41 16 Claims



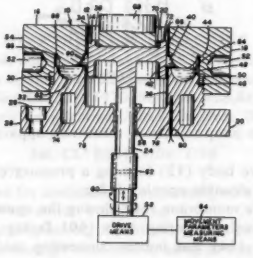
1. A cigarette testing device comprising a conveyor drum which is arranged to carry cigarettes sideways through a testing station, and which includes a portion formed with circumferentially spaced flutes, each terminated at opposite ends by sprocket-like teeth, the cigarettes being carried in the recesses between the teeth, said recesses having semi-circular bottom portions for closely fitting half-way around a cigarette circumference and having a depth at least equal to a cigarette diameter whereby each cigarette during testing lies entirely within the cooperating recesses; stationery means mounted closely adjacent to the said portion of the conveyor drum and defining with the flutes a suction or pressure chamber, so that at least part of each cigarette is surrounded by pre-determined suction or pressure during testing; a rotary member adjacent to the drum and formed with axially spaced sets of sprocket teeth which are axially slightly off-set from and over lap with the sprocket-like teeth on the drum so that the cooperating teeth together form two axially spaced seals around each cigarette restricting communication between the chamber and atmosphere; and a device for sensing the air-flow through the wrapper of each cigarette produced by the suction or pressure in the chamber.

3,935,729

GAP FILLER FOR RHEOMETER

Robert V. McCarthy, Columbia, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jan. 27, 1975, Ser. No. 544,654
Int. Cl.² G01N 11/10
U.S. Cl. 73—60 11 Claims



1. In a rheometer having a cylindrical stator with a cavity therein and a rotatable cylindrical rotor concentrically positioned within said cavity and with a space therebetween, heating means supplying heat to said stator, the improvement comprising said stator being formed of two parts having

a. a cylindrical bottom part having a concave, annular reservoir in the surface thereof which abuts with the second part of said stator, and

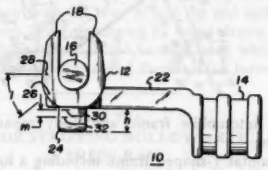
b. a cylindrical top part having an annular embossment on the surface thereof which abuts with said aforesaid reservoir containing surface of said bottom stator part, said embossment shaped and positioned to fit into said reservoir, means for axially moving said top and bottom parts into abutting relationship at the aforesaid surfaces with said embossment and reservoir moved together, and passageway means connecting said reservoir and said space between said stator and rotor such that molten material extrudes from said reservoir into the space between the stator and rotor when said embossment and reservoir are moved together.

3,935,730

METHOD AND GAUGE FOR NONDESTRUCTIVELY TESTING AND CERTIFYING THE WORKABLE QUALITIES OF A CASTING

Albert Michael Luongo, Edison; Frank J. Reynolds, North Brunswick, and Rudolph R. Ruetsch, Union, all of N.J., assignors to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 2, 1974, Ser. No. 511,170
Int. Cl.² G01N 3/20
U.S. Cl. 73—100 7 Claims



1. The method of nondestructive testing and certifying the workable qualities of a cast metallic part comprising: the steps of forming a tab on said cast metallic part in a nonfunctional location, when considered in light of the intended use of said cast metallic part subjecting said tab to a strain greater than the strain to which the cast metallic part will be subjected to when employed; inspecting said tab after said tab has been subjected to said strain, and discarding any cast metallic part whose strained tab shows signs of cracking.

3,935,731

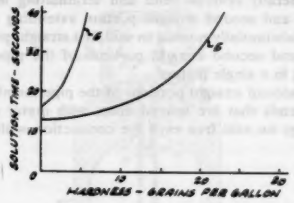
METHOD AND MEANS FOR IMPROVING FLAW ENTRAPMENT EFFICIENCY IN WATER-WASHABLE INSPECTION PENETRANTS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Continuation-in-part of Ser. No. 163,643, July 19, 1971, abandoned, which is a continuation of Ser. No. 875,552, Nov. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 590,353, Oct. 28, 1966, abandoned. This application Feb. 28, 1975, Ser. No. 554,084
Int. Cl.² G01N 29/04, 13/02
U.S. Cl. 73—104 2 Claims

1. In a process of penetrant inspection of test parts for surface discontinuities, comprising the steps of applying a solvency-sensitive water-washable dyed penetrant to a test surface, treating said test surface by washing with a water-wash remover to effect removal of excess surface penetrant, and inspecting said test surface for the presence of penetrant entrapment indications, the improvement that avoids solution-removal of penetrant entrapments in crack defects which

comprises; raising the temperature of said water-wash remover to above the point of solvency transition of said dyed penetrant, said temperature of solvency transition being within the range of about 90° F. up to the boiling point of



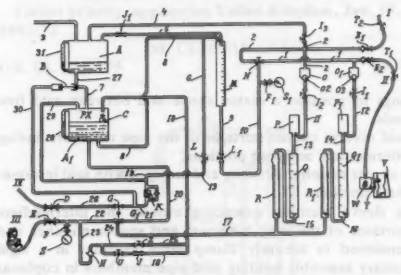
water, and applying said water-wash remover with sufficient relative movement between the remover and the penetrant-treated test surface to remove the excess penetrant from said surface.

3,935,732

PROCESS AND APPARATUS FOR THE MEASUREMENT OF VOLUME, FLOW RATE AND CONSUMPTION, AT A PREDETERMINABLE PRESSURE, OF COMBUSTIBLE LIQUID BY AN APPARATUS IN PLACE AND FUNCTIONING

Francois Monnet, Nice, France, assignor to S.A.R.L. Sud est Electro Mecanique S.E.E.M., Nice, France

Filed July 19, 1974, Ser. No. 490,126
Int. Cl.² G01M *15/00*
U.S. Cl. 73—118 **6 Claims**



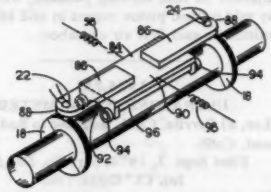
1. Apparatus for monitoring and regulating carburetors and other gasoline consumption devices, comprising a first conduit, means for feeding test liquid under pressure from a source of liquid to said first conduit, a flowmeter, an auxiliary reservoir for said liquid, a first valve in said first conduit, conduit means connecting said first valve to said auxiliary reservoir and to said flowmeter, said first valve selectively directing flow of said liquid through said conduit means either directly from said source of liquid to said flowmeter or from said auxiliary reservoir to said flowmeter, a float valve in said auxiliary reservoir for arresting the flow of liquid from said first conduit to said auxiliary reservoir when said auxiliary reservoir is full of said liquid, a check valve in said conduit means for preventing the flow of said liquid from said auxiliary reservoir back to said first conduit, a second conduit for air under pressure, a pressure regulator in said second conduit, a second valve in said second conduit coupled to said first valve and so arranged that said second valve is open when said first valve is in the position in which the flowmeter is fed from the auxiliary reservoir and is closed when said first valve is in a position that the flowmeter is fed directly from said source of fluid under pressure, said second conduit supplying air under pressure to said auxiliary reservoir, a vertical graduated gauge whose lower part is in fluid communication with a carburetor to be tested and whose upper part is connected to the lower part of the auxiliary reservoir and to said pressure regulator, a third valve between the upper end of the gauge and the pressure regulator whereby when the third valve is open, air under pressure forces liquid in the gauge toward the bottom of the gauge and when the tird valve is closed, liquid under pressure can flow into the gauge, and a calibrated overflow conduit for said gauge for maintaining said gauge under pressure.

3,935,733

ELECTRONIC TRANSMISSION DYNAMOMETER

Earle R. Schindler, New Orleans, La., assignor to Resco, Inc., New Orleans, La.

Filed Nov. 14, 1974, Ser. No. 523,772
Int. Cl.² G01L *3/10*
U.S. Cl. 73—136 A **2 Claims**



1. An electronic transmission dynamometer, for determining torque, revolutions per minute, and horsepower of a rotating loaded shaft, comprising:

a. audio signal generator means for generating periodic signals having a range of audio frequencies;

b. separate recording mediums spaced axially apart and peripherally and non-magnetically applied on said shaft for rotation therewith;

c. two record-playback heads fixed in spaced relationship to each other over said shaft and respectively adjacent said axially spaced apart recording mediums;

d. a cradle adapted to ride on said rotating shaft and held from rotating therewith by flexible means transversely and oppositely connected to said cradle and respective fixed points for fixing said record-playback heads in said spaced relationship and respectively over said recording mediums;

e. electronic means for sequentially amplifying, differentiating and converting said picked-up and playback signals into pulses having variable widths proportional to shaft torque, and fixed widths proportional to revolutions per minute of the shaft, and for converting said variable and fixed width pulses into voltages proportional to said shaft torque and revolutions per minute, and for multiplying said proportional voltages to obtain a voltage proportional to shaft horsepower; and

f. voltmeter means, calibratible for direct readout in terms of horsepower, torque and revolutions per minute, for receiving and displaying reception results of said proportional voltages.

3,935,734

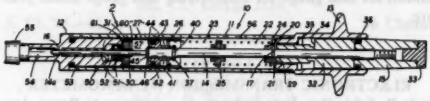
PIPETTES

William P. Keegan, 155 Beach 133rd St., Belle Harbor, N.Y. 11694

Filed Feb. 26, 1975, Ser. No. 552,971
Int. Cl.² B01L *3/02*
U.S. Cl. 73—425.6 **7 Claims**

1. A pipette comprising, means forming a first air chamber and a second air chamber, measuring piston means movable a predetermined distance in said first air chamber between a

first limiting position and a second limiting position, second piston means movable in said second air chamber, said second piston means having a cross sectional area substantially greater than that of said measuring piston menas, valve means separating said air chambers so that said measuring piston means displaces air from said first air chamber while said second piston means compresses air in said second air chamber, actuating means for moving said measuring piston means



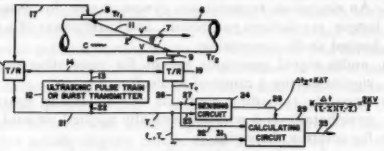
and said second piston means, first fixed stop means for arresting said measuring piston means in its first limiting position, second fixed stop means for arresting said measuring piston means in its second limiting position, and means for actuating said valve means when said measuring piston means is immediately adjacent its first limiting position, whereby air compressed by said second piston means in said second air chamber is admitted to said first air chamber.

3,935,735

ULTRASONIC FLOW METER

Bock W. Lee, El Cerrito, Calif., assignor to Badger Meter, Inc., Richmond, Calif.

Filed Sept. 3, 1974, Ser. No. 502,518
Int. Cl.² G01F 1/66
U.S. Cl. 73—194 A **22 Claims**



1. An ultrasonic flow meter for measuring the velocity of fluid flow axially in a pipe comprising:

a pair of transducers adapted to be disposed on said pipe to provide between them an energy path having a component axially of said pipe and a component transversely of said pipe,

means for simultaneously sending a pair of similar signals from said transducers in opposite directions along said path,

means for receiving said signals at said transducers,

means for providing a signal corresponding to the transit time t, of one of said signals along said path,

means for determining the difference in transit times, Δt, between said oppositely directed signals,

means for providing a signal corresponding to the square of said transit time t^2,

means for providing a quotient signal proportional to Δt, divided by t^2, said quotient signal being substantially proportional to the velocity, V, of fluid flow such that $\Delta t/t^2 \propto v/l$, where l is the length of said path.

3,935,736

METER SETTER

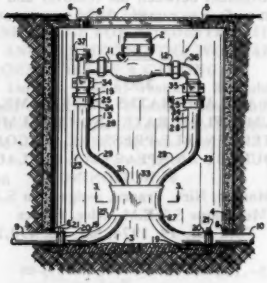
William E. Enright, 11307 Summit St., Kansas City, Mo. 64114

Filed Aug. 19, 1974, Ser. No. 498,741
Int. Cl.² G01F 15/18
U.S. Cl. 73—201 **6 Claims**

1. Meter setter apparatus for supporting a utility meter in a meter box and connecting said meter in a service system comprising:

a. inlet and outlet pipe members with each having first straight portions in substantially axial alignment and with remote ends having fittings for connection to supply and sevice lines, adjacent portions of each of said first straight portions of the pipe members being curved upwardly in a generally reverse bend and terminating in a further bend and second straight portion extending away from and substantially normal to said first straight portion, said first and second straight portions of the pipe members being in a single plane;

b. said second straight portions of the pipe members having free ends that are spaced apart with meter connecting fittings on said free ends for connection with meter fit-



tings to position a meter above and between said free ends;

c. said reverse curved portions of the pipe members having intermediate adjacent portions;

d. a spacer member between and engaged with said intermediate portions;

e. a sleeve member extending around the intermediate portions of the pipe members and spacer member and tensioned to securely clamp same together in a rigid unitary assembly holding said pipe members in coplanar relation whereby said first straight portions act as feet with said assembly serving as the sole support of a meter connected to the fittings on the free ends of the second straight portions.

3,935,737

FLOW INDICATOR

Arvid A. Molitor, 1101 Florimond Drive, Elgin, Ill. 60120

Filed Mar. 6, 1975, Ser. No. 555,894
Int. Cl.² G01F 1/28
U.S. Cl. 73—228 **11 Claims**

1. A device for measuring fluid flow comprising:

a housing defining a chamber,

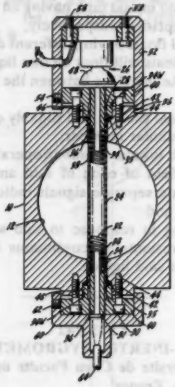
said housing having an inlet and an outlet communicating with said chamber,

a flexible tube extending across the chamber intermediate said inlet and outlet and generally normal to the direction of flow through said chamber,

a light source directing a beam of light axially into one end of said flexible tube,

means adjacent the other end of the tube for detecting the intensity of said beam at said other end,

said flexible tube being deflected in response to fluid flow through the chamber, thereby modulating the intensity of



light received at said other as a function of the rate of flow through said chamber.

3,935,738

LIQUID LEVEL DETECTING DEVICES

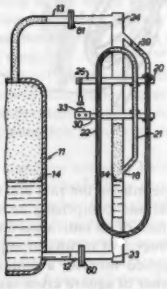
Hugh Michael Benham, London, England, assignor to ABTEC Limited, London, England

Filed Jan. 14, 1974, Ser. No. 433,408

Claims priority, application United Kingdom, Jan. 19, 1973, 2903/73

Int. Cl.[2] G01F *23/22*

U.S. Cl. 73—295 13 Claims



1. A liquid level detecting device adapted for use with a vapour generator comprising a stack tube having a lower liquid inlet, an upper vapour inlet, lower connector means for attaching the lower liquid inlet to the vapour generator at a level below the operating liquid level thereof, upper connector means for attaching the upper vapour inlet to the vapour generator at a level above the operating liquid level thereof, and at least one cooling tube with one end communicating with the stack tube at an upper cooling tube inlet and the other end communicating with the stack tube at a lower cooling tube outlet at a level above the stack tube liquid inlet, each cooling tube changing direction at least twice between its inlet and outlet so as to provide at least a first portion extending down from the upper cooling tube inlet to a region below the lower cooling tube outlet, a third portion extending up from the lower cooling tube outlet to a region adjacent the upper cooling tube inlet, and a second portion interconnecting said first and third portions, the first, second and third portions of the cooling tube being disposed relative to the stack tube so that when the stack tube is in use, the first, second and third portions are disposed so that the lower ends of said first and second portions together afford a generally U-shaped collecting region in which any liquid formed by condensation of vapour in said first and second portions will collect in said collecting region, and at least one sensing device located in sensing relationship to at least one of said first, second and third portions and arranged to sense the change in temperature of said portion and to produce a signal in response to sensing a change of temperature of a predetermined magnitude.

3,935,739

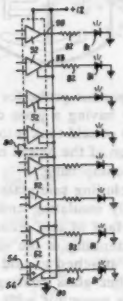
LIQUID LEVEL GAUGING APPARATUS

Edward G. Ells, Norwich, N.Y., assignor to Liquidometer Corporation, Norwich, N.Y.

Filed Apr. 10, 1974, Ser. No. 459,591

Int. Cl.[2] G01F *23/26*

U.S. Cl. 73—304 C 6 Claims



1. In a liquid storage installation, a liquid-level indicator means comprising, in combination:

a. a storage tank having a large body of liquid stored therein,

b. an upright, electrically conducting probe device immersed in said body of liquid and adapted for contact at a multiplicity of levels therewith,

c. a second probe device cooperable with said first-mentioned probe device, said second prove device comprising an upright row of electrodes insulated from each other and adapted for immersion in said body of liquid in proximity to said first-mentioned probe device so as to form a plurality of capacitors therewith,

d. an electrical guard comprising a conducting cylinder encircling said probe devices,

e. means connected with said guard for maintaining it at a predetermined level of potential,

f. means for generating an a.c. signal having a substantially constant frequency and for applying it to the first probe device, portions of said signal being capacitively coupled to said electrodes,

g. a plurality of rectifier and filter circuits having output terminals, and having input terminals connected with said electrodes, respectively, so as to receive energy therefrom,

h. a plurality of comparators having first input terminals connected respectively with the output terminals of said rectifier and filter circuits, having second input terminals connected to means having a constant D.C. potential, and having output terminals,

i. a plurality of summing resistors connected respectively to the output terminals of said comparators, and

j. a meter,

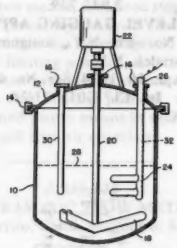
k. said summing resistors having a common lead connected to said meter such that contributions of each comparator are algebraically summed by the meter.

3,935,740

LIQUID LEVEL PROBE

John Butler Whitney, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed June 20, 1974, Ser. No. 481,127
Int. Cl.² G01F 23/26
U.S. Cl. 73—304 C 3 Claims



1. A liquid level capacitor probe for a reactor tank having an elongated member having a glass coating and projecting vertically from the top of said tank into said tank and extending a substantial portion of the height of said tank, said liquid level capacitor probe comprising:

insulating means including said glass coating on said member for electrically insulating and protecting at least a portion of the surface of said member; and

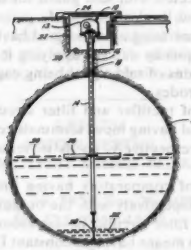
a strip electrode extending in the elongated dimension of said member and attached to said glass coating and surrounded by another glass coating, said strip electrode thereby forming a capacitor with said reactor tank, the magnitude of which is dependent upon the dielectric constant media between said electrode and said reactor tank.

3,935,741

LEVEL SENSOR

Herbert G. Zinsmeyer; Rodney L. Johnson, both of Austin, and Ralph H. Genz, Leander, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 388,593, Aug. 15, 1973, abandoned. This application Mar. 7, 1974, Ser. No. 448,978
Int. Cl.² G01F 23/12
U.S. Cl. 73—313 21 Claims



1. A storage tank liquid level sensor comprising

an elongated tubular member adapted to be inserted into a storage tank,

first means on said tubular member for sensing the level of a first liquid in said tank,

second means on said tubular member for sensing the level of a second liquid in said tank having an interface with the first liquid comprising, respectively,

first and second floats having different densities, whereby one of said floats will float on one liquid and the other will float at the interface between the liquids, each float including

an annular affixed thereto and slidably engaging the exterior of said tubular member,

means inside each tubular member operable in response to the magnetic field of each of said annular magnets to constantly create separate signals indicative of the level of each liquid, and

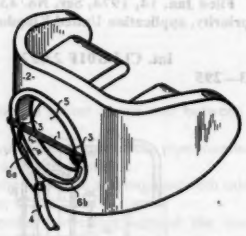
means functioning in response to said sensing means for providing a substantially continuous indication of the level of each of said liquids.

3,935,742

LOW-INERTIA HYGROMETER

Boris Rybak, Universite de Caen Faculte des Sciences - Zoophysiologie, Caen, France

Continuation-in-part of Ser. No. 369,457, June 13, 1973, abandoned. This application Oct. 9, 1974, Ser. No. 513,180
Int. Cl.² G01N 27/04
U.S. Cl. 73—336.5 20 Claims



1. Device for determining the rate and amplitude of breathing of an individual and comprising an element adapted for application to the face of an individual and being formed with an opening in the buccal or oro-nasal region of the face when said element is applied thereto, a unitary, integral elongate dielectric rod member of square cross-section and having end portions fixed to said element with its intermediate portion, between said end portions, disposed across said opening, said dielectric member having at least one smooth surface to accelerate evaporation of moisture from said member produced by the flux of water vapour present during a breathing exhalation cycle, said dielectric member being of a substance lacking electrical conductivity excepting when subjected to moisture during a breathing cycle during which its electrical conductivity varies in proportion to the amount of moisture exhaled during said cycle, a single pair of conductors connected to said dielectric member at said end portions thereof, electrical energy supplying means coupled to said single pair of conductors, and indicating means having two input terminals respectively coupled to said conductors for indicating the rate and amplitude of the electrical signal generated by said electrical energy supplying means through said dielectric member during the exhalation part of each breathing cycle.

3,935,743

TEMPERATURE INDICATORS

Donald E. Brodie, 706 Briarwood Court; Matthew Camarota, 904 Gainsway Road, both of Yardley, and Charles R. Jankowski, 109 Lions Drive, Morrisville, all of Pa. 19067

Filed July 15, 1974, Ser. No. 488,513
Int. Cl.² G01K 11/08
U.S. Cl. 73—343 R 8 Claims

1. A temperature sensitive device especially adaptable for use in taking a child's temperature comprising:

a confectionery body having a cavity extending to at least one end thereof;

an elongated flexible resilient stem having a first end thereof inserted into said cavity;

said first end having at least one opening provided completely therethrough which is substantially completely enclosed by said confectionery member when the first end of the stem is positioned in the confectionery head; said opening being in the shape which would be formed by a plane geometrical figure passing through said stem;

a temperature sensitive element at least partially filling said opening in said stem;

said confectionery head having at least a portion thereof which is substantially transparent so as to facilitate observation of the temperature sensitive element in said opening from either direction transverse to the plane of said opening;

said temperature sensitive element being of a contrasting color relative to the substantially transparent portion of the confectionery member through which it is viewed;

said element adapted to be substantially completely melted at a predetermined temperature level so as to substantially completely flow out of said opening and thereby effectively disappear from said stem to provide a positive indication of the predetermined temperature level.

3,935,744

CLINICAL THERMOMETER

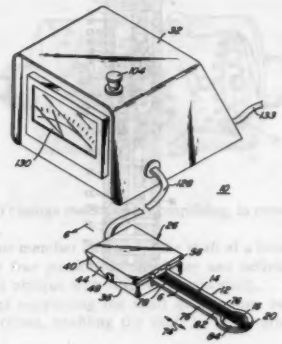
Paul Beckman, Huntington Valley, Pa., assignor to United States Surgical Corporation, Baltimore, Md.

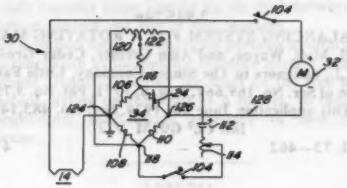
Continuation-in-part of Ser. No. 324,015, Jan. 16, 1973, abandoned. This application Sept. 18, 1973, Ser. No. 398,327
Int. Cl.² G01K 7/12, 1/18
U.S. Cl. 73—361 49 Claims

1. An oral or rectal probe for a clinical thermometer, comprising:

an elongated, electrical nonconductive member having a first end of suitable size and shape for insertion into the mouth or rectum of a patient, said first end having a recess formed therein;

thermopile means having a plurality of thermocouples connected in series mounted on said member and defining at least three hot junctions near said first end of said member and at least three cold junctions near a second end of said member, said hot junctions being positioned along a line which is transverse to said member and in the area of said recess so that said hot junctions are separated from one another and from said member by air gaps; and





a pair of electrical contacts mounted on said member near said second end and electrically connected to said thermopile means, said second end of said member being detachably mountable in a housing comprising at least part of a system for using the emf developed by said thermopile in determining the oral or rectal temperature of said patient.

3,935,745

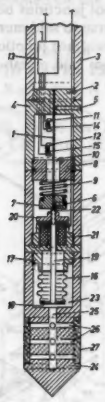
PORE WATER PRESSURE MEASURING DEVICE

Per Olof Jonell, Engelbrektsgatan 24, S-441 37 Goteborg, and Kjell Ingvar Elmgren, Kometgatan 2 F, S-441 00 Alingsas, both of Sweden

Filed Aug. 19, 1974, Ser. No. 498,379
Claims priority, application Sweden, Sept. 4, 1973, 7312007
Int. Cl.² G01L 9/00
U.S. Cl. 73—398 R 6 Claims

1. An improved pore water pressure meter attached to a probe rod for insertion into the ground, the meter comprising a pressure responsive device responsive to the pore water pressure to be measured, and a force meter arranged to be actuated by the pressure responsive device, the improvement comprising a power member operatively connected to said pressure responsive device and selectively actuatable for applying a force on said pressure responsive device of such magnitude as to override the pore water pressure force exerted by said pressure responsive device so as to prevent said pressure responsive device from affecting said force meter

when said power member is actuated, and to thereafter relieve the force exerted by said power member on said force meter



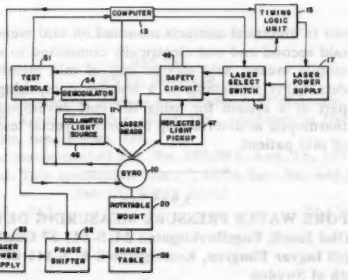
and allow said pressure responsive device to again transmit its force to said force meter.

3,935,746

BALANCING SYSTEM FOR A ROTATING MASS

Dean H. Moll, Wayne, and Alan Greiner, Cedar Grove, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Division of Ser. No. 169,661, Aug. 6, 1971, Pat. No. 3,795,784.
This application June 26, 1974, Ser. No. 483,149
Int. Cl.[2] G01M 1/22
U.S. Cl. 73—462 **4 Claims**



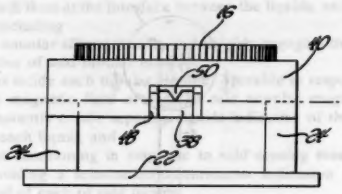
1. A method of determining mass unbalance of a pivotally mounted flywheel in a free rotor gyroscope having pick-offs for sensing tilting of said flywheel along first and second orthogonal axes lying in a plane perpendicular to the spin axis of the flywheel, comprising the steps of aiming the spin axis at Polaris, orienting the first reference axis as close to vertical as possible, recording the tilt of said flywheel with respect to said first and second axes, rotating said reference plane 90° about the spin axis with the spin axis still aimed at Polaris so that said second axis is oriented as close to vertical as possible, recording the tilt of said flywheel with respect to said first and second axes and computing mass unbalance from the flywheel tilt with respect to said first and second positions.

3,935,747

DEVICE FOR LOCATING MASS CENTERS AND OTHER PURPOSES

C. Franklin Boehret, 834 S. Union Street, Grass Lake, Mich. 49240

Filed July 30, 1973, Ser. No. 384,110
Int. Cl.[2] G01M 1/14
U.S. Cl. 73—483 **7 Claims**



1. A device for locating mass centers and the like, comprising; a first and second set of knife edge supports with knife edges of each set in precise alignment and relatively spaced apart and with the respective sets of knife edge supports disposed transversely with respect to each other for providing distinctly separate axial coordinates for balance computations, a base member for establishing a reference plane and having the first of said knife edge support sets provided thereon, a first member supported upon said first knife edge support set, a second member formed to receive and essentially enclose said first member therewithin for supported engagement upon said second knife edge support set, said second knife edge support set being provided on one of said first and second members whereby said second member is relatively supported and balanced upon said first member and is receptive of a work part thereon for evaluation, said first member having a first channel groove provided on the underside thereof and first means at relatively opposite ends thereof received upon said first knife edge support set, a second channel groove provided across said first member on the other side thereof and second means at relatively opposite ends thereof providing balancing support for said second channel groove being formed precisely to the depth of said first channel groove for intersection therewith and for disposing the bottom walls of each of said channel grooves in a common plane of reference relatively within and between the opposite side faces of said first member.

3,935,748

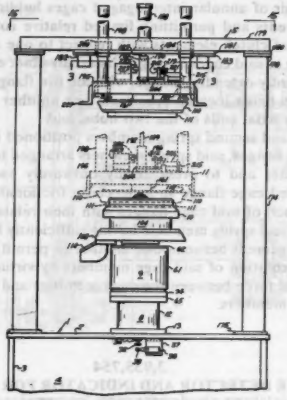
UNIVERSALLY TILTABLE BALANCING MACHINE FOR INFLATED PNEUMATIC TIRES

Robert J. Lannen, Wixom, Mich., assignor to Micropoise Engineering Company, Wixom, Mich.

Filed Feb. 4, 1974, Ser. No. 439,526
Int. Cl.[2] G01M 1/04, 1/12
U.S. Cl. 73—484 **79 Claims**

1. A balance testing machine for pneumatic tires including,
a base,
a seating member mounted on said base and adapted to pivotally receive,
a carrier seated upon the seating member, and adapted for universal tilting travel thereon relative to a substantially vertical axis, said carrier including,
tire retention to removably receive a tire for air sealed retention on the carrier,
air conducting means to inflate and deflate a tire retained by said retention means,
a first air passage in said-seating member having optional continuity with,
a second air passage in said carrier,
means to interrupt said continuity, to afford said tilting

travel, after inflation of a tire and to restore said continuity for deflation of such tire, and



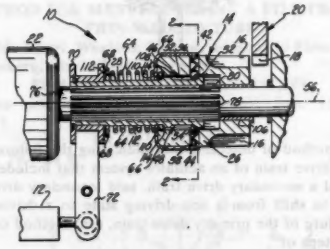
means to resist escape of air from a tire when said continuity is interrupted.

3,935,749

STARTING APPARATUS

Karl Groves, Brecksville, Ohio, assignor to VLN Corporation, Cleveland, Ohio

Filed Sept. 5, 1974, Ser. No. 503,373
Int. Cl.² F02N *11/00*; F16D *41/00*, *43/04*
U.S. Cl. 74—6 13 Claims



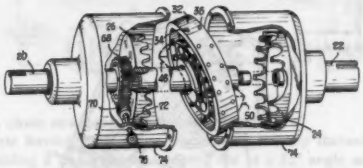
1. An apparatus for use in an engine starting system having a starting motor for effecting rotation of an engine gear, said apparatus comprising a drive gear movable between a disengaged condition and an engaged condition in meshing engagement with the engine gear, means for effecting movement of the drive gear from the disengaged condition to the engaged condition, a ball, first surface means for cooperating with said ball to effect rotational movement of said drive gear relative to the engine gear upon movement of said drive gear from the disengaged condition toward the engaged condition with teeth on said drive and engine gears in a misaligned relationship, and second surface means for cooperating with said ball to effect rotational movement of said drive and engine gears under the influence of said starting motor when said drive gear is in the engaged condition.

3,935,750

COUNTERBALANCED MECHANICAL SPEED-CHANGE MECHANISM

Arthur M. Maroth, Marath Engineering Co., Gruman Hill Road, Wilton, Conn. 06897

Filed Oct. 23, 1973, Ser. No. 408,931
Int. Cl.² F16H *33/00*
U.S. Cl. 74—61 20 Claims



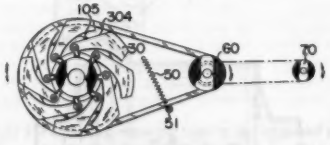
1. A speed change mechanism comprising, in combination:
a. a shaft,
b. a nutator member carried by the shaft at a location intermediate free portions of the latter and defining a plane which is oblique with respect to said shaft,
c. bearings supporting the shaft at locations beyond said free portions, enabling the shaft to have turning movements,
d. means for causing said member to nutate in response to turning of the shaft, said means tending to cause a longitudinal flexing of said free portions of the shaft,
e. a rotary member adjoining said mutator member, said rotary member being carried by the shaft between a free portion thereof and one of said bearings,
f. said members having coengaging portions to effect a drive therebetween as the nutator member nutates, and
g. weight means carried by the shaft on the free portions thereof, acting on the shaft as it rotates, to oppose the longitudinal shaft-flexing tendency of said nutating means.

3,935,751

CENTRIFUGAL STEPLESS SPEED CHANGING DEVICE

Kuang-Chang Lee, 19, Lane 33, Ta Tung West Road, Tao Yuan, China /Taiwan

Filed Jan. 6, 1975, Ser. No. 539,026
Int. Cl.² F16H *55/54*
U.S. Cl. 74—230.18 5 Claims



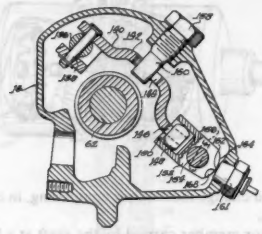
1. A centrifugal stepless speed changing device comprising a rotary disk having a top surface and a shallow annular groove at its central portion and a plurality of holes arranged around said shallow groove; a positioning body having a bottom portion with a plurality of grooves, each of which grooves has a bottom surface the bottom portion of said positioning body is mounted on said shallow annular groove of said rotary disk; and a claw blocks set having a plurality of claw blocks are arranged in sequence, each of said claw blocks having a flange at one end and a V-shaped groove at the other end for receiving a belt, a hole is provided adjacent to said flange end, said flanges of said claw blocks are placed on said grooves of the positioning body respectively and assembled together by means of a plurality of bolts through said holes of the claw blocks and the holes of said rotary disk.

3,935,752

TRANSMISSION

Donald W. Kelbel, and John W. Holdeman, both of Muncie, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 441,679, Feb. 11, 1974. This application Dec. 9, 1974, Ser. No. 531,015
Int. Cl.² G05G 9/12
U.S. Cl. 74—473 R 7 Claims



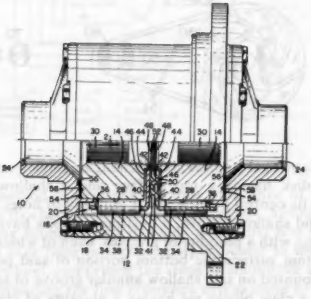
1. In a transmission, a housing, input and output shafts respectively journalled in said housing, said input shaft defining an input gear, at least one ratio output gear rotatably supported on said output shaft, a cluster gear assembly journalled in said housing and defining a drive gear meshing wiht said input gear and at least one ratio input gear in meshing relationship with said ratio output gear, means supported by said output shaft and axially movable for clutching said ratio output gear to said output shaft, first and second shift rails supported in said housing for rotational and axial movement, said clutching means being engageable by said second shift rail upon rotational movement thereof and being axially movable thereby upon axial movement thereof for said clutching, linkage means connecting said shaft rails for effecting movement of said second shift rail in response to movement of said first shift rail.

3,935,753

POSITIVE DRIVE DIFFERENTIAL

Richard D. Williams, Vancouver, Wash., assignor to Warn Industries, Inc., Kent, Wash.

Filed Feb. 18, 1975, Ser. No. 550,180
Int. Cl.² F16H 35/04
U.S. Cl. 74—650 11 Claims



1. A differential drive mechanism comprising:

a. a rotatable drive casing having radially inwardly facing clutch surfaces,

b. a pair of driven hub members coaxially mounted on a longitudinal axis in end to end relationship in the drive casing for independent rotation,

c. a pair of sets of clutch elements freely mounted between the drive casing and each of said hub members for circumferential movement between a released position and a driven position between the clutch surfaces of the drive casing and the hubs,

d. a pair of annular interengaged cages holding the clutch elements and permitting limited relative rotation of the sets of clutch elements with respect to one another,

e. each of said cages having at its axially inner end a radially inwardly extending flange, with the two flanges of the two cages being located proximate one another between the inner axial ends of the two hubs, and

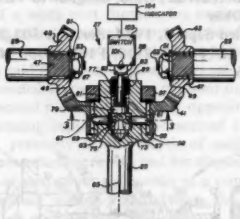
f. first and second spring members positioned between said cage flanges, said spring members arranged to engage one another and to press axially outwardly each against a related cage flange so as to cause frictional engagement of each of said cage flanges with their related hub member, said spring members having sufficiently low frictional engagement between one another to permit limited relative rotation of said cage members by virtue of the frictional force between the cage members and their related hub members.

3,935,754

FAILURE DETECTOR AND INDICATOR FOR AIRCRAFT FLAP ACTUATION SYSTEM

Virgilio Comollo, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Napoli, Italy

Filed June 14, 1974, Ser. No. 479,293
Int. Cl.² F16H 37/06, 5/52, 35/00; B64C 9/00
U.S. Cl. 74—665 F 29 Claims



1. A method of detecting and indicating the failure of the primary drive train of an actuator system that includes a primary and a secondary drive train, said secondary drive train adapted to shift from a non-driving state to a driving state upon failure of the primary drive train, said method comprising the steps of:

forming a free motion zone in said secondary drive train;

sensing when the free motion zone is crossed; and,

providing an indication that the free motion zone has been crossed.

5. Apparatus for detecting and indicating the failure of the primary drive train of an actuator system that includes a primary and secondary drive train, said secondary drive train including a coupling system for coupling power between a driven torque tube, and at least one secondary torque tube, said apparatus comprising:

at least one free motion zone formed in said coupling system;

at least one detecting means for detecting the crossing of said at least one free motion zone; and,

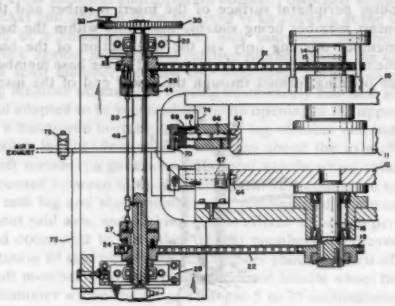
an indicating means coupled to said at least one detecting means for providing an indication of the crossing of said at least one free motion zone.

3,935,755

TURRET ALIGNMENT APPARATUS

Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd., City of Industry, Calif.

Filed July 10, 1974, Ser. No. 487,219
Int. Cl.² B23B 29/32
U.S. Cl. 74—815 11 Claims



1. In a machine tool apparatus having rotatable turret means, a power source, a drive shaft rotatably coupled to said power source, a drive train coupling said drive shaft to said turret means, and shot pin means engageable with the turret means for aligning the turret means in an exact rotational position, the improvement comprising:

releasable coupling means for providing limited relative rotational movement between said drive shaft and said turret means, and

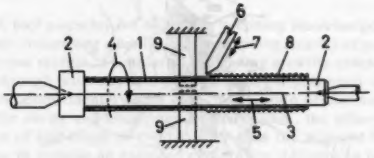
control means for decoupling said releasable coupling means prior to said shot pin means engaging said turret means for freeing the turret means from the drive shaft during turret means exact alignment and for coupling the releasable coupling means immediately upon disengagement of said shot pin means from said turret means.

3,935,756

METHOD FOR MANUFACTURING A FILE FROM A THIN-WALLED TUBE

Ernst Udo Ebert, Wexford, Ireland, assignor to Firma August Ruggeberg, Marienheide, Germany

Filed Jan. 15, 1975, Ser. No. 541,101
Claims priority, application Germany, Jan. 15, 1974, 2401671
Int. Cl.² B24B 73/06
U.S. Cl. 76—24 R 6 Claims



1. A method for manufacturing a file with filing or rasping teeth from a hollow thin-walled tube composed of tool steel, said file having a noncircular cross-sectional profile, comprising:

forming multiple, helical file teeth on the surface of the unshaped thin-walled tube; and

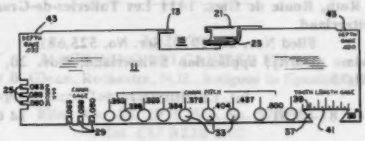
shaping the toothed tube into a noncircular cross-sectioned profile by applying shaping forces exclusively on the inside wall of the tube.

3,935,757

CHAIN SAW TOOL

Elof Granberg, 200 S. Gerrard, Richmond, Calif. 94801

Filed Jan. 13, 1975, Ser. No. 540,429
Int. Cl.² B23D 63/16; G01B 5/02
U.S. Cl. 76—74 2 Claims



2. A chain saw gauge comprising

a plate having a file guide disposed at the top thereof for guiding a chain saw sharpening file at a 35° angle across the cutting edge of a cutter link of a saw chain held against said plate,

a precise set of graduated projections formed along the edge of said plate for measuring the width of the cutter bar groove,

a precise set of graduated openings formed in said plate for measuring the chain gage,

a set of precisely aligned circular holes disposed in said plate at graduated predetermined distances for measuring the chain pitch,

a trapezoidal opening formed in said plate with precise graduations disposed along one edge of said recess for measuring the cutting tooth top plate length, and

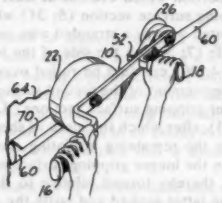
means formed on said plate for measuring the height of the depth gauge of a chain saw cutter tooth.

3,935,758

TOOL FOR APPLYING MASKING TAPE TO MOLDINGS

Dean A. Polzin, 2033 E. Birch Run Road, Burt, Mich. 48417; Arthur J. Trickey, and Arthur M. Trickey, both of 12108 N. Saginaw Road, Clio, Mich. 48420

Filed Mar. 5, 1975, Ser. No. 555,579
Int. Cl.² B65H 75/40
U.S. Cl. 81—3 R 10 Claims



1. A tool for applying masking tape to the exposed surfaces of moldings attached to supporting surfaces so that at least one longitudinal edge of the molding is supported adjacent to but unattached to the supporting surface, comprising: an elongated frame member; a tape support reel rotatably supported adjacent one end of the frame member so that the reel axis extends normally to the frame member; an applying roller rotatably supported adjacent the opposite end of the frame with its rotational axis parallel to and on the same side of the frame as the rotational axis of the tape reel; a roller having a resilient surfce and a flange member having its edge extending radially outward beyond the resilient surface; and handle means connected to the frame for supporting the tool, whereby the flange may be inserted between the longitudinal edge of a molding and the supporting surface so that the resilient section of the roller presses against the edge of the molding to allow the length of tape to be attached to the

molding edge and pressed against the edge by the resilient section of the roller.

3,935,759

DEVICE FOR BARING INSULATED ELECTRICAL CONDUCTOR WIRE AND STRANDED WIRE

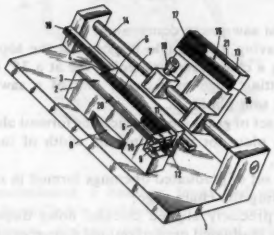
Paul Roth, Route de Glez, 1411 Les Tuileries-de-Grandson, Switzerland

Filed Nov. 20, 1974, Ser. No. 525,681

Claims priority, application Switzerland, Nov. 20, 1973, 16328/73

Int. Cl.[2] H02G 1/12

U.S. Cl. 81—9.51 14 Claims



1. A device for baring electrical conductor wires and stranded wires, comprising a first surface and a second surface movable over and relative to said first surface, an equalsized gripping section (16;32) on said second surface is movable over a longer lamellar gripping section (4; 30) on said first surface and an equal-sized gripping section (17; 53) on said second surface is movable over a shorter lamellar gripping section (5; 31) on the first surface positioned and running near an end portion of the longer gripping section (4; 30) of said first surface in the longitudinal direction of these surface sections (4, 5, 16, 17; 30, 31, 32, 33), a knife (7; 34) positioned between the longer and the shorter gripping section (4 and 5; 30 and 31) of the first and/or second surface and projecting an adjustable amount above said surface, said knife having a cutter portion which extends at least in the area of the shorter gripping surface section (5; 31) whereby an end piece of an insulated wire or a stranded wire projecting laterally over the knife (7; 34) on the side of the longer gripping surface section (4; 30) can first be rolled over the knife (7; 34) through the movement of the second surface between the longer and shorter gripping surface sections (4, 5 and 16, 17; 30, 31 and 32, 33), after which the piece of sheathing thereby circuincised from the remaining insulating sheathing can be rolled on between the longer gripping surface sections (4 and 16; 30 and 32), thereby turned relative to the wire or the stranded wire, the latter snaked and lastly the end of wire or stranded wire drawn out of the cut piece of insulating sheathing.

3,935,760

TOOL FOR REMOVING SHOCK ABSORBERS AND THE LIKE

Bobby W. Taylor, Rte. 1, Cache, Okla. 73527

Filed Jan. 31, 1974, Ser. No. 438,224

Int. Cl.[2] B25B 13/06

U.S. Cl. 81—55 7 Claims

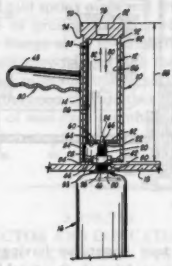
1. A tool for removing a threaded member from a nut fastener or the like, comprising:

a base member, having an upper end, a lower end and an opening extending a distance therethrough intersecting the upper end and the lower end thereof;

a plate connected to the lower end portion of the base member substantially encompassing the base member opening generally near the lower end of the base member, a nut opening being formed through the plate and intersecting the base member opening for removably and retainingly receiving the nut fastener or the like;

a handle connected to the base member and spaced a distance from the lower end of the base member; and

an insert member, having an upper end, a lower end and an outer peripheral surface, the nut opening in the base member being smaller than the diameter formed via the outer peripheral surface of the insert member and the insert member being slidably insertable within the base member opening only via the intersection of the base member opening with the upper end of the base member, an opening formed through the lower end of the insert



member for removably and retainingly receiving a portion of the threaded member, the nut opening being shaped and sized independent of the shape and size of the opening in the lower end of the insert member and independent of the size and shape of the insert member, and the insert member being rotatable within the base member opening for rotating the portion of the threaded member disposed through the opening in the insert member lower end, the rotation of the insert member unthreadingly removing the threaded member from the nut fastener or the like while substantially maintaining the base member and the nut fastener or the like retainingly received thereby in a relatively stationary position.

3,935,761

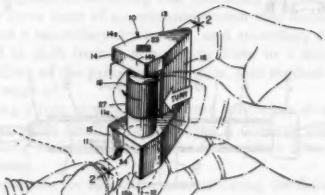
DENTAL HANDPIECE WRENCH

Wolfgang O. Junkel, Mount Prospect, Ill., and Jeffrey M. Kneipper, Kenosha, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 19, 1975, Ser. No. 551,006

Int. Cl.[2] B25B 1/00

U.S. Cl. 81—55 25 Claims



1. A wrench for contra-angle handpieces comprising a C-shaped body having horizontally-projecting upper and lower arms and a vertical connecting strut therebetween; said lower arm having a socket in its undersurface for receiving the

upper portion of a contra-angle handpiece head and having a vertical bore extending through said lower arm and communicating with said socket; a burtube-chuck adjusting assembly disposed between said arms and projecting into said socket through said bore; said assembly including a vertically-elongated shaft member having a lower end portion of non-circular cross sectional configuration normally disposed within said socket and adapted to be received in an opening at the upper end of a handpiece chuck to lock said shaft member and chuck against independent relative rotation about the axis of the shaft member; at least one depending burtube-engaging lug member normally projecting downwardly into said socket and adapted to be received within an opening at the upper end of a handpiece burtube to lock said lug member and burtube against independent relative rotation about the axis of said shaft member; a generally cylindrical handle wheel rotatably mounted between said arms and operatively connected to one of said lug and shaft members for rotating said one member about said axis; and locking means affixed to said upper arm and connected to the other of said members for preventing rotation of said other of said members about the axis of said shaft member; said generally cylindrical handle wheel having a diameter within the range of about 5 to 25 millimeters; said vertical connecting strut having a thickness, measured normal to a plane parallel with the axis of said shaft member, substantially less than the diameter of said handle wheel.

3,935,762

TOOL ASSEMBLY FOR MOUNTING BITS

Vincent J. Tudisco, Emerson, N.J., assignor to Creative Tools, Inc., Bennington, Vt.

Filed Nov. 12, 1974, Ser. No. 523,168
Int. Cl.² B25B *15/00*
U.S. Cl. 81—177 G **7 Claims**

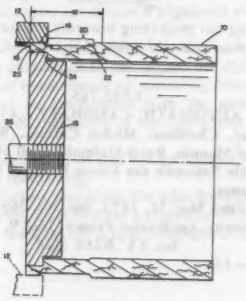
1. A tool assembly for releasably retaining interchangeable tool bits comprising a handle member having a cavity of polygonal cross section, a tubular shank having a cavity extending therethrough with one end portion having a polygonal cross section complementary with said cross section of said handle member cavity and snugly seated therewithin, the other end portion of said shank of greater width than the adjacent body portion to provide an enlarged end portion defining an internal peripheral shoulder at the juncture thereof generally facing the open end of said enlarged end portion; a tool bit receiving socket having a body portion seated in the cavity of said other end portion of said shank and having an external collar at its outer end seated against said open end of said shank, said socket having its inner end abutting said internal shoulder of said shank, said socket having a tool bit receiving cavity opening at its outer end and releasable tool bit retaining means and an outwardly facing shoulder in said cavity both spaced inwardly from the open end thereof; and a tool bit having a body portion seated in said socket cavity and a work engaging portion outwardly thereof, said body portion abutting said socket shoulder to limit movement inwardly of said socket cavity, said releasable retaining means releasably engaging said body portion of said tool bit to retain it within said cavity.

3,935,763

MACHINING VULCANIZED FIBRE

Robert B. Glenn, Rochester, N.H., assignor to Spaulding Fibre Company, Inc., Tonawanda, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,824
Int. Cl.² B23B *3/00*
U.S. Cl. 82—1 C **4 Claims**



1. In the method of manufacturing a ring-shaped part of predetermined axial length by machining a segment of vulcanized fibre tubing having a predetermined wall thickness, said segment having a waste material portion adjacent one end thereof, the improvement comprising the preliminary steps of

reducing said wall thickness in an axially extended region of said waste material portion that is axially spaced from said one segment end,

providing a chucking lip intermediate said region and said one segment end, said lip projecting above the adjacent surface of said region, and

providing an annular stop surface spaced from said one segment end in the surface of said segment wall opposed to the segment surface that incorporates said chucking lip.

3,935,764

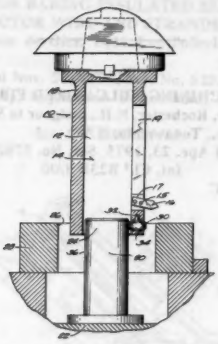
GUIDING MEANS FOR BORING BAR

Kasimir Janiszewski, 11908 W. Loomis Road, Franklin, Wis. 53132

Filed Mar. 5, 1975, Ser. No. 555,461
Int. Cl.² B23B *41/06*
U.S. Cl. 82—1.2 **4 Claims**

1. In apparatus for boring holes including a rotatable and longitudinally movable boring bar having a free end and a generally radially projecting work tool for engaging and removing material from a bore in a work piece, the improvement comprising wall means defining an axial opening in said

boring bar and a guide element separate from said boring bar and telescopically receivable in said opening, and guide means



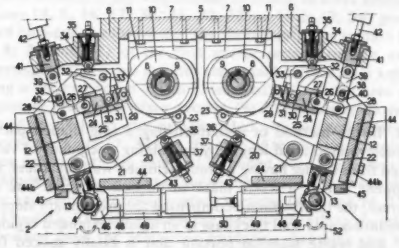
on said boring bar projecting inwardly into said axial opening and engageable with said guide element.

3,935,765

AUTOMATIC CAMSHAFT LATHE

Henri Peltier, Chatillon; Michel Catrain, Bures-sur-Yvette, and André Monnin, Rueil-Malmaison, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 31, 1973, Ser. No. 365,817
Claims priority, application France, June 9, 1972, 72.20958
Int. Cl.[2] B23B *3/28*
U.S. Cl. 82—19 13 Claims



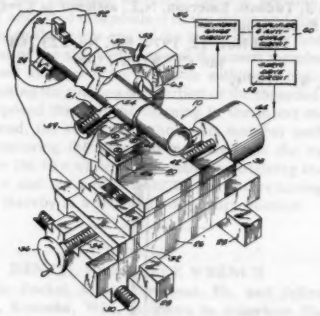
1. An automatic lathe assembly for supplying elongated workpieces at machining stations in a lathe, simultaneously machining separate surfaces at a plurality of spaced work stations along the length of said elongated workpieces supported at machining stations in said lathe, and removing said machined workpieces from said machining stations, said automatic lathe comprising at each work station a tool slide having a machining tool thereon and mounted for movement by mechanical transmission means operably connected thereto, driven tool feed and tool orienting cams for actuating said mechanical transmission means to feed and orient said tool slides and the machining tools mounted thereon, and workpiece supporting means including opposed members for mounting therebetween the elongated workpieces for rotation about their longitudinal axes at a first machining station in said lathe, said lathe further comprising longitudinally extending support beam means extending above a workpiece at said first machining station, bearing bracket means rigidly mounted on and projecting downwardly from said beam means, a first shaft supported in spaced relation below said beam means by said bearing bracket means for rotation about its longitudinal axis extending parallel to and spaced above the axis of a workpiece mounted at said first machining station, one each of said feed and said orienting cams being coaxially mounted on said first shaft for rotation therewith in side-by-side relation to one another at each said work station along the workpiece at said first machining station and substantially above said workpiece, said mechanical transmission being located substantially above said workpiece with only said tool slide and the machining tool thereon extending down to said workpiece thereby leaving below said workpiece an unobstructed space; drive means for simultaneously rotating said shaft and said workpiece about their longitudinal axes and; means for moving said workpiece supporting means longitudinally during machining of said workpieces so that axial feeding is accomplished by movement of the workpieces; and automatic cross transfer means for automatically supplying and removing workpieces positioned into said unobstructed space, said transfer means including means for positioning and removing directly said workpieces between said supporting means.

3,935,766

METHOD AND APPARATUS FOR MACHINING CYLINDRICAL TUBES

Christopher F. Masters, 2525 South Shore Drive, Milwaukee, Wis. 53207

Filed Oct. 9, 1973, Ser. No. 404,542
Int. Cl.[2] B23B *21/00, 3/28;* B23C *1/16*
U.S. Cl. 82—21 A 13 Claims



1. Apparatus for machining an elongated cylindrical tube having eccentric inner and outer cylindrical surfaces to reduce the eccentricity thereof, said apparatus comprising means for rotating the tube about the axis of its outer cylindrical surface, ultrasonic measuring means for measuring the wall thickness in a radial direction from the tube center of a relatively small spot on said tube prior to machining while it is rotating and said means producing an output signal whose magnitude is proportional to said tube wall thickness, said measuring means including a sensor, means for mounting said sensor adjacent to said tube, and externally of said tube at a fixed distance from the axis of rotation of said tube to measure the wall thickness of the tube as it rotates, machining means for removing material from said tube wall at a spot adjacent to said sensor, and subsequent to measuring the thickness of the wall at the spot, means for simultaneously moving said sensor and said machining means longitudinally along the length of said rotating tube to measure and machine the wall thereof along a helical path, and drive means coupled between the output of said measuring means and said machining means to move the machining means toward and away from the tube in a direction transverse to movement of the sensor to cause a depth of cut on the tube if required equal to the measured wall thickness minus a pre-selected final machined wall thickness thereby reducing the eccentricity of the inner and outer surfaces to the tube.

3,935,767

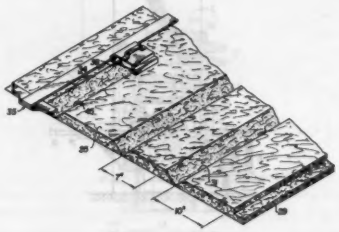
MULTIPLE GAUGING DEVICE

Alexander W. McClay, Jr., 29 W. Bank St., Petersburg, Va. 23803

Division of Ser. No. 53,951, July 10, 1970, Pat. No. 3,824,695. This application July 8, 1974, Ser. No. 486,653

Int. Cl.[2] 144 *136 R*; B26D *3/06*

U.S. Cl. 83—5 2 Claims



1. A method for making ducts by positioning a guide-edge across an insulating structural board, having a metal foil vapor barrier on one side thereof, in a series of spaced apart positions along which selected tools may be guided to vertically cut, or to remove material to form a groove in order that sides between lapped corner joints may be formed for the fabrication of ducts or like structures of multiple sides, in which said positioning is effected by a reelable linear measurer with its housing demountably carried by said guide-edge and having its zero end connected to a distance gauge comprising diagramatically indexed alignment means spaced therealong, being used in a series of similar dimensioning sequences beginning with an immediately prior edge, or cut, and subsequently indicating the position of the guide-edge for the next cut, directly in terms of the required inside dimension of that side of the structure after fabrication, comprising the steps of:

placing the insulating board on a cutting table, or other support, with its metal foil side down,

determining the specified inside dimensions of the required duct;

selecting the one of the plurality of alignment means which offsets the zero end of the linear measurers from the right hand edge of the board a predetermined distance equal to the width of a stapling flap;

setting the position of the guide-edge at the zero end of the so-located linear measurer and parallel to the right hand edge of the board,

making a vertical cut along the guide-edge, through the insulating material but not cutting the metal foil;

separating the material, to the right of the cut, from the metal foil to form a stapling flap;

mounting the linear measurer on the staight-edge and placing a second alignment means in alignment with the edge thus exposed, said second alignment means offsetting the zero end of the linear measurer a distance equal to the sum of the widths of material to be removed from the first side of the structure being fabricated plus one half of the width of the grooving tool;

moving the guide-edge to the left, and parallel to the prior cut, until the specified inside dimension, of the side of the structure being layed off, as indicated by the unreeling linear measurer, intersects the guide-edge, and with the guide-edge held in this position, placing the gauge and linear measurer to the left of the guide-edge, and

moving the grooving tool along said edge to cut a first groove;

replacing the linear measurer with its housing atop the guide-edge and placing said second alignment means in alignment with said last-mentioned groove;

again moving the guide-edge to the left, and parallel to the prior cut, to the point where the required inside dimension of this side of, as indicated by the unreeling linear measurer, intersects the guide-edge,

placing the gauge and measurer to the left of the guide-edge,

holding said edge in this position and moving the grooving tool therealong to cut a second groove;

again mounting the linear measurer, together with its housing, atop the guide-edge,

placing said second alignment means in alignment with the second groove,

while holding the alignment means in this position, moving the guide-edge to the left, and parallel to the prior cut, until said linear measurer, unreeling from its housing, indicates at its intersection with the guide-edge, the required inside dimension of the side of the structure being layed-off,

holding the guide-edge in this position and moving the grooving tool therealong to cut a third groove;

and finally, again mounting the linear measurer, in its housing, atop the guide-edge,

placing a third alignment means in alignment with said third groove,

and while holding the alignment means in this position, moving the guide-edge to the left and parallel to the prior cut until said linear measurer, unreeling from its housing, indicates, at its intersection with the guide-edge, the required inside dimension of the fourth and final side of the structure,

holding the guide-edge in this last mentioned position,

making a cut therealong,

moving a rabbeting tool along the edge formed by the first cut of the sequence, to form a rabbet to receive said butt edge when the material is structured into a closed configuration,

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3,935,768

METHOD OF MAKING A DISPOSABLE DIAPER

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 296,982, Oct. 12, 1972, Pat. No. 3,837,955, which is a division of Ser. No. 111,188, Feb. 1, 1971, Pat. No. 3,731,689. This application June 6, 1974, Ser. No. 476,952

Int. Cl.[2] B26D *3/00*

U.S. Cl. 83—39 4 Claims

1. A method of making the pouch for a disposable diaper having a fluid absorbent body and pouch integrate therewith, said fluid absorbent body having a front side and a back side, said back side having a fluid impervious surface and said pouch having a wall portion thereof common with said impervious surface in at least one waist region of the diaper and in at least a portion of the remaining region of the diaper, the remainder of the pouch wall comprising a supple, fluid impervious sheet attached to said body whereby said impervious surface and said sheet form opposing wall portions of said pouch, said method comprising slitting a flattened tube of fluid impervious sheet material

a. through two opposing wall portions thereof along a line transverse to the longitudinal axis of the tube from a

longitudinal edge of the flattened tube partially across the width of said flattened tube and

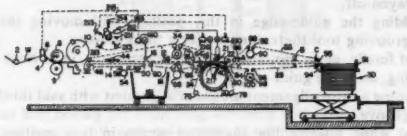
b. along a line extending longitudinally from one end of the flattened tube to said transverse slit, with the longitudinal slit being closer said longitudinal edge than an inner portion of the transverse slit.

3,935,769

TANDEM COLLECT SINGLE WEB SHEET CUTTER AND STACKER

David Noel Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,248
Int. Cl.² B65H 35/08
U.S. Cl. 83—79 8 Claims



1. A high speed sheet cutting, delivering and stacking mechanism comprising in combination, means for advancing sheet material in web form to a sheet cutting device where the web is cut into sheets, a sheet conveying means for conveying the cut sheets to a foraminous sheet collecting drum where the individual cut sheets are collected, air shower means for guiding individual sheets onto said foraminous collecting drum in registered packets and for removing the packets of sheets from said foraminous collecting drum, a common drive means for the sheet cutting device, sheet conveying means and foraminous collecting drum, and a slow-down-speed-up sheet packet transfer conveying means for accepting packets of sheets from said foraminous collecting drum and delivering said sheet packets to a sheet stacking means, the improvement comprising:

a. a transmission means having a 2:1 drive ratio connected between said sheet cutting device and said foraminous collecting drum; and,

b. an air shower control means driven by said sheet cutting device for actuating said air shower means to collect packets of cut sheets that are shorter in length than one half the circumference of said foraminous collecting drum in tandem on said foraminous collecting drum.

3,935,770

PUNCHING PRESS WITH TOOL EXCHANGING MEANS

Alfred Bareis, Uhingen; Karl Dangelmaier, Goppingen-Holzheim, and Joachim Von Wiassaty, Albershausen, all of Germany, assignors to L. Schuler GmbH, Germany

Filed Mar. 15, 1974, Ser. No. 451,674
Claims priority, application Germany, Mar. 15, 1973, 2312898
Int. Cl.² B26D 7/06
U.S. Cl. 83—95 24 Claims

1. Punching press apparatus comprising:

an exchangeable tool set having first and second punching tools,

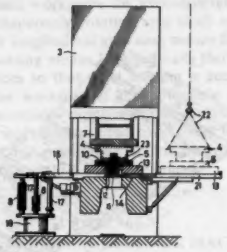
pressing ram means for pressing said first and second tools toward one another to punch parts from sheet material interposed between said first and second tools,

a press table supporting said second tool,

at least one stacking duct for stackingly accommodating a plurality of said parts punched out by said tools,

and tool exchanging means including movement accommodating means for accommodating movement of said second tool relative to said press table in a direction transverse to the stacking direction in which said at least one stacking duct extends,

wherein each of said at least one stacking ducts extends through said second tool from respective positions where said parts are punched out and terminates on the side of the second tool which faces said press table at a spacing from said press table such that said second tool can be



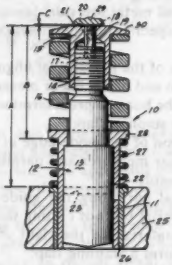
moved with respect to said press table in said transverse direction without emptying said at least one stacking duct and without separation of said at least one stacking duct from said second tool, each of said at least one stacking ducts being carried in their entirety with and movable with said second tool in said transverse direction.

3,935,771

PUNCH AND STRIPPING GUIDE ASSEMBLY

Percy L. Cady, Jr., Darien Center, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,823
Int. Cl.² B26D 7/26
U.S. Cl. 83—140 9 Claims



1. Tooling for use in a punching device, said tooling comprising:

a. a punch-guide and stripper sleeve;

b. a punch having a body slidably disposed in said sleeve and having a threaded upper end portion, said threaded end portion having an axial opening of non-circular cross-section;

c. a punch head threaded onto said end portion and having an axial opening therethrough of non-circular crosssection;

d. a stripping spring acting between said sleeve and said punch head to urge the lower end of said punch into said sleeve; and

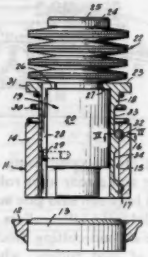
e. a locking rod of non-circular cross-section extending into both of said openings for preventing rotation of said punch head.

3,935,772

PUNCHING DEVICE HAVING SELECTABLE PINCH POINT CLEARANCE

Duane J. Demus, Elba, and Vitmar G. Von Langendorff, Tonawanda, both of N.Y., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,605
Int. Cl.² B26D 7/06
U.S. Cl. 83—140 **5 Claims**



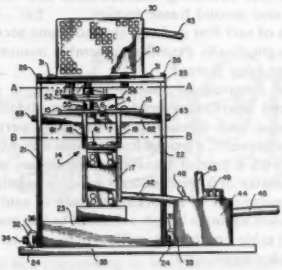
1. A punching device comprising:
a. a frame having a lower arm on which a die is supported, and an upper arm having a vertical bore aligned therewith;
b. a punch-guide and stripper sleeve slidably disposed in the bore in said upper arm;
c. a punch having a body slidably disposed in said sleeve;
d. a stripping spring acting between said sleeve and said punch to urge the lower end of said punch into said sleeve;
e. a lifting spring acting between said sleeve and said upper arm and urging said sleeve away from said die; and
f. a horizontal retainer pin in said frame, and chordally intersecting said bore through a selected one of a plurality of vertically spaced holes, there being a corresponding plurality of laterally facing slots in the outer wall of said sleeve which are vertically spaced from each other by an amount differing from the vertical spacing of said holes and through which said pin passes chordally.

3,935,773

APPARATUS FOR CONDITIONING COMPONENT LEADS

Donald H. Daebler, Albuquerque, N. Mex., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 17, 1975, Ser. No. 559,109
Int. Cl.² B23D 25/12; B26D 7/06
U.S. Cl. 83—331 **22 Claims**



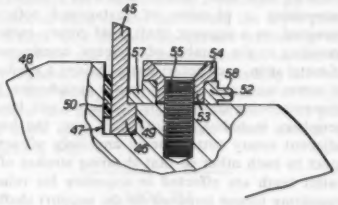
1. Apparatus for conditioning leads of a component that has a body with at least one lead extending from a surface thereof, comprising:
a first gear having an axis and having teeth on the circumference thereof,
a second gear having an axis and having teeth on the circumference thereof,
first supporting means supporting said gears relative to a common plane therethrough that is perpendicular to the axes of said gears with the teeth thereof meshing,
the ends of the teeth on at least said first gear being truncated such that at the mesh point of said gears the end of a truncated tooth on said first gear is spaced a distance from the valley between teeth on said second gear by an amount that is substantially equal to the thickness of a component lead,
drive means coupled to at least one of said gears for providing rotating motion of said gears,
second supporting means for supporting components over a path that extends past the mesh point of said gears along a line that is generally parallel to the tangent to said gears with the component surface spaced from the common plane and component leads extending from this surface in the direction of the common plane, and
means for moving the componepts along the path with a length of component lead adjacent the component surface passing through the mesh point of said gears for thereby conditioning the leads.

3,935,774

MOUNTING DEVICES FOR A BLADE OF A ROTARY CUTTING MACHINE

Richard Adrian Craddy, Bristol, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed June 21, 1974, Ser. No. 481,865
Claims priority, application United Kingdom, June 22, 1973, 29660/73
Int. Cl.² B26D 1/36, 4/72
U.S. Cl. 83—355 **8 Claims**



1. A mounting device for mounting a blade on a rotary drum of a rotary cutting machine, the blade lying generally radial to the axis of the drum and extending lengthwise of the drum, the sides of the blade defining generally radial flanks, the device comprising an eccentric pivotally mounted on the drum on a generally radial axis, and arranged to bear against a said radial flank of the blade, to locate the blade in a radial direction and also to vary the position of the blade in a tangential direction with respect to the drum, and means for fixing the eccentric in the desired position of adjustment.

3,935,775

IRON PIECE SHEARING MACHINE

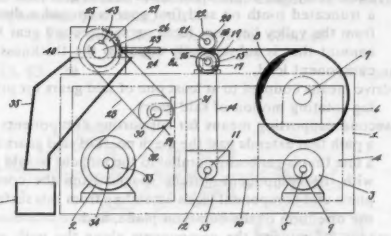
Masami Sato, Yokohama, Japan, assignor to Sango Company, Limited, Japan

Filed Aug. 16, 1974, Ser. No. 498,849

Claims priority, application Japan, Aug. 28, 1973, 48-100867[U]

Int. Cl.[2] B26D 5/20, 7/06, 1/20

U.S. Cl. 83—355 6 Claims



1. A shearing machine for producing a plurality of metal elements comprising, in combination:

a metal strip supply source from which a plurality of adjacent, continuous lengths of metal strip are payed out in increment;

a pair of upper and lower feed rollers positioned along a passage of said lengths of metal strip and extending from said strip supply source and defining a nip therebetween;

a pair of upper and lower stationary blades positioned along said strip passage, downstream of said feed rollers and defining a strip guide clearance therebetween and into which said adjacent continuous lengths of metal strip simultaneously pass;

and a high speed, rotary cutter assembly positioned adjacent the distal ends of said stationary blades, said cutter assembly having a plurality of shearing teeth in the outer periphery thereof for cooperating at the clearance with said stationary blades for shearing small pieces of the metal strips stimultaneously and into rectangular cross-sectional elements as the strip elements are fed in increment by said feed rollers, said rotary cutter assembly comprising a plurality of juxtaposed rotary cutters mounted on a support shaft, said rotary cutters corresponding to the number of adjacent, continuous lengths of metal strip, each rotary cutter having a similar number of cutter teeth and identical outer peripheries, the cutter elements being transversely apertured and having inner periphery including a radial key way, the key way of adjacent rotary cutters being angularly off set with respect to each other so that shearing strokes of adjacent cutter teeth are effected in sequence for relieving and equalizing torque imposed on the support shaft.

3,935,776

PAPER CUTTING MACHINE

James C. Dingus, 175 Kentucky Drive, Newport, Ky. 41071

Filed Aug. 22, 1974, Ser. No. 499,549

Int. Cl.[2] B26D 7/06, 1/02

U.S. Cl. 83—425.4 28 Claims

1. For use in trimming copy reproduced on a paper, said copy consisting of printed material arranged in elongated columns, the combination comprising:

a frame having spaced side support means;

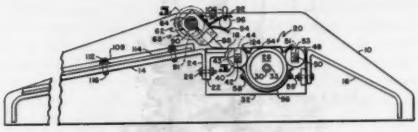
a forward paper support table mounted between said side support means;

paper driving means mounted aft of said forward table;

a paper cutting block between said forward table and said paper driving means;

first and second knives, each having a sharpened straight cutting edge terminating at a point, said straight edges being biased against said cutting block at a slight angle thereto, the straight cutting edges of said knives being parallel to the direction of travel of said film;

adjusting means for independently adjusting the lateral positions of each of said knives to align said knives with the edges of said columns; and



said paper driving means comprising a drive roller, a forward idler roller and a rear idler roller, all of said rollers being supported between said side supporting means with their axes parallel, said idler rollers resting on said drive roller, the plane of said cutting block being substantially tangent to all of said rollers, whereby said paper is wrapped around said idler rollers and at least 180° of said drive roller.

3,935,777

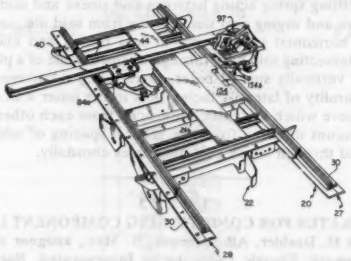
PORTABLE CUTTING DEVICE

Alvin Lee Bassett, 3414 Renick St., St. Joseph, Mo. 64507

Filed June 13, 1974, Ser. No. 478,934

Int. Cl.[2] B27B 9/04

U.S. Cl. 83—471.3 32 Claims



1. A portable cutting device comprising:

a table having

a. first and second frame sections maintained in parallel spaced apart relationship by a plurality of attaching members extending between said first frame section and said second frame section;

b. each of said first and said second frame sections having a longitudinally extending assembly mounted along an upper edge thereof;

c. said longitudinal assemblies having a plurality of spaced apart transverse assemblies slidably mounted thereon and extending substantially perpendicularly therebetween, a pair of longitudinal assemblies cooperate with a pair of transverse assemblies to define the perimeter of a quadrilateral which quadrilateral forms the perimeter of a working surface of said table;

guide means having a length sufficient to traverse a diagonal of said table and having sufficient rigidity to resist bending under stress; and

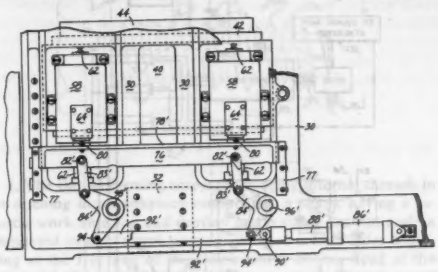
cutting means coacting with said guide to permit said cutting means to traverse a substantial portion of the length of said guide.

3,935,778

APPARATUS FOR ACTUATING A PLURALITY OF PISTON AND CYLINDER ASSEMBLIES

Frederick A. Pretty, Alveston, England, assignor to USM Corporation, Boston, Mass.

Filed July 5, 1974, Ser. No. 485,886
Claims priority, application United Kingdom, July 10, 1973, 32804/73
Int. Cl.² B26D 5/12; B30B 1/08
U.S. Cl. 83—639 3 Claims



1. A fluid pressure operated system for driving the movable platen of a press against the cooperating platen comprising:

A. Two pairs of piston and cylinder means operatively connected to the movable platen on either side thereof to drive said platen into engagement with the cooperating platen;

B. A source of fluid under pressure, connected to each piston and cylinder means;

C. Valve means associated with each piston and cylinder to control the flow of pressurized fluid to said piston and cylinder, said valves being mechanically actuatable;

D. An actuating bar assembly mounted on the press for movement into and out of engagement with the mechanical actuating mechanism of the valve means; said assembly having a pair of elongated bars each being operatively engageable with the mechanical actuating mechanism of the valves which are, in turn, operatively associated with the paired piston and cylinders; and

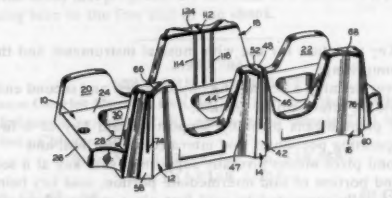
E. Drive means operatively associated with the pair of actuating bars to simultaneously move said actuating bars in tandem into engagement with the valve actuating mechanisms to cause the plurality of piston and cylinders to cooperatively drive the movable platen against the cooperating platen.

3,935,779

MITRE BOX

William J. Hildebrandt, West Simsbury, and Richard H. Russell, Farmington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Nov. 27, 1974, Ser. No. 527,541
Int. Cl.² B27G 5/02
U.S. Cl. 83—762 12 Claims



1. A mitre box comprising an integrally molded structure of synthetic resin having an elongated base portion, a plurality of rigid post members spaced apart along one side thereof, and a rigid elongated vertically extending guide member on the opposite side thereof aligned with one of said post members, said guide member and said one post member having aligned vertical channels therein extending perpendicularly to the longitudinal axis of said structure, said guide member having at least one additional vertical channel therein spaced along the length thereof from said first mentioned channel therein and extending at an angle to the longitudinal axis of said structure, another of said guide posts having a vertical channel therein aligned with the angular channel of said guide member, said channels opening at the top surface of said posts and guide member, said post members and guide member each having a peripheral wall extending upwardly from said base portion and a cavity therewithin.

3,935,780

BAND SAW DRIVE ARRANGEMENT

John A. Hoffmann, Lake Lynwood, Lynn Center, Ill. 61262

Filed Feb. 24, 1975, Ser. No. 552,449
Int. Cl.² B26D 1/46, 1/54
U.S. Cl. 83—820 7 Claims

1. In a band saw, the combination comprising: an idler pulley mounted for rotation about a first axis; a driven pulley mounted coplanar to the idler pulley for rotation about an axis spaced from and parallel to the first axis; a drive pulley having a diameter less than the diameter of each of the idler and driven pulleys mounted between and coplanar with the idler and driven pulleys for rotation about a third axis parallel to the first and second axes; means for driving the drive pulley; an endless flexible belt trained about and extending directly between the drive and driven pulleys; and an endless flexible saw band trained about and extending directly between the driven and idler pulleys with the inner surface of the portion of the endless saw band extending about the driven pulley in frictional drive engagement with the outer surface of the endless flexible belt.

3,935,781

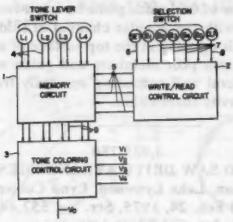
VOICE PRESETTING SYSTEM IN ELECTRONIC MUSICAL INSTRUMENTS

Hirokazu Katoh, and Akinori Endo, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed July 30, 1974, Ser. No. 493,650
Claims priority, application Japan, Aug. 3, 1973, 48-86777
Int. Cl.² G10H 1/02
U.S. Cl. 84—1.11 5 Claims

1. A voice presetting system for an electronic musical instrument comprising, a tone-coloring circuit means having means for receiving a plurality of musical voice signals representative of musical voices as inputs and to be delivered therefrom as outputs with tone coloring thereof varied, a memory circuit means for storing binary-coded information signals read out and applied to the tone-coloring circuit means for

control of the tone-coloring circuit means for control of the tone color variations of the musical voice signals, means on said memory circuit means including binary coders for introducing manually thereinto said binary-coded information signals, a write and read control circuit means for controlling



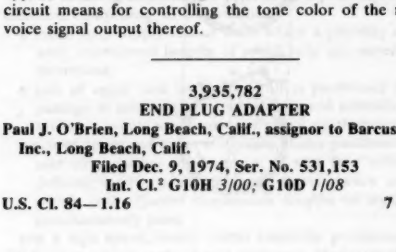
writing of binary-coded information signals and alternatively controlling read out of the binary-coded information signals applied to the tone-coloring circuit means from said memory circuit means for controlling the tone color of the musical voice signal output thereof.

3,935,782

END PLUG ADAPTER

Paul J. O'Brien, Long Beach, Calif., assignor to Barcus-Berry, Inc., Long Beach, Calif.

Filed Dec. 9, 1974, Ser. No. 531,153
Int. Cl.[2] G10H 3/00; G10D 1/08
U.S. Cl. 84—1.16 7 Claims



1. In a stringed musical instrument adaptable for having an electronic pickup transducer connected thereto, said instrument having a rib member and a body section with a foot portion having an end block therein, the improvement comprising:

an elongated tubular body extending through said rib member and into said end block, said body being oriented substantially parallel to the longitudinal axis of the instrument,

electrical connector means disposed within said body for connection to said pickup, and

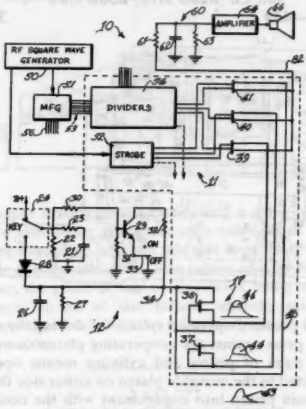
said tubular body including end plug means for securing an instrument support strap, said end plug means projecting outwardly of said rib and substantially parallel to said longitudinal axis of said instrument.

3,935,783

ELECTRONIC PIANO CIRCUIT

William V. Machanian, Lewiston, N.Y., and Robert R. Williams, St. Joseph, Mich., assignors to The Wurlitzer Company, Chicago, Ill.

Filed July 8, 1974, Ser. No. 486,503
Int. Cl.[2] G10H 1/06, 5/10
U.S. Cl. 84—1.21 18 Claims



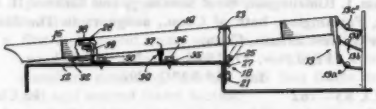
1. An electronic musical instrument of the keyboard type comprising: electronic means for audibly producing a square wave fundamental frequency and at least one square wave harmonic frequency thereof in response to the actuation of a key on a keyboard, said electronic means including gate circuit means for providing amplitude control of said square wave fundamental and harmonic frequencies, and means responsive to said amplitude control of said electronic means for adding together said fundamental and harmonic frequencies at predetermined points in time along the zero, attack, peak, and decay of a characteristic piano voice curve.

3,935,784

DOUBLE TOUCH KEY FOR MUSICAL INSTRUMENTS

Donald Bernard Koepke, Franklin Park, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Apr. 25, 1975, Ser. No. 571,532
Int. Cl.[2] G10C 3/12
U.S. Cl. 84—435 19 Claims



1. Key structure for use with musical instruments and the like comprising:

a lever defining a key having opposite first and second ends and an intermediate portion;

first pivot means pivotally supporting said key at a first operating portion of said intermediate portion; and

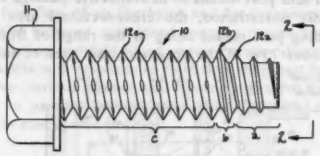
second pivot means pivotally supporting said key at a second portion of said intermediate portion, said key being pivotally supported by said first pivot means when said first end is depressed from a rest position to a first preselected depressed position and being pivotally supported by said second pivot means when said first end is depressed beyond said first preselected position.

3,935,785

THREAD SWAGING SCREW

Paul R. Lathom, Rockford, Ill., assignor to Rockford Headed Products, Inc., Rockford, Ill.

Filed Jan. 3, 1974, Ser. No. 430,476
Int. Cl.² F16B 25/00
U.S. Cl. 85—46 7 Claims



1. The thread forming screw for swaging internal threads in an opening in a workpiece comprising, a shank having a tapered work entering end portion and a sizing portion and an elongated straight shank portion arranged in that order beginning at the free end of the shank and a driving head at the other end of the shank, the shank having a continuous external rolled thread thereon including a number of shank turns on the shank portion; at least one and less than two sizing turns on the sizing portion; and at least one work entering turns on the work entering end portion, the sizing turns being contiguous at one end thereof to the shank turns on the shank portion and at their other end with the work entering turns on the work entering portion, said shank having a polygonal cross-section and the turns of said helical thread each having an odd number of circumferentially spaced lobes and intermediate sides with the root, pitch and crest radii vectores of the turns varying circumferentially of the shank from a maximum root, pitch and crest radii vectores at the lobes to a minimum root, pitch and crest radii vectores at the sides, the shank and sizing turns having a constant pitch along the shank portion and uniform maximum root and pitch radii vectores at the lobes and uniform minimum root and pitch radii vectores at the sides and the same preselected included angle between the flanks of the turns inwardly of the pitch radii vectores, the shank turns outwardly of the pitch radii vectores having a uniform maximum crest radii vectores at the lobes and an included angle between the flanks of the threads the same as said preselected included angle between the flanks of the shank turns inwardly of the pitch radii vectors, the sizing turns in an region outwardly of the pitch radii vectores having an included angle between the thread flanks slightly less than said preselected included angle between the flanks inwardly of the pitch radii vectores and maximum crest radii vectores at the lobes slightly greater than the maximum crest radii vectores of the shank turns and sufficient to at least substantially compensate for the radial and axial contraction of the dedendum portion of the internal thread turns swaged in the workpiece when the sizing turn passes, the work entering turns merging with the sizing turn and having maximum crest radii vectores at the lobes that progressively decrease in a direction from the sizing turn to the free end of the shank.

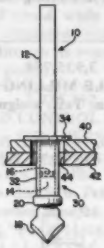
3,935,786

SELF-DRILLING RIVET

Pierre Charles Murray, DeKalb, and Richard Maclay Chattin, Schaumburg, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 1, 1974, Ser. No. 519,958
Int. Cl.² F16B 13/04
U.S. Cl. 85—68 10 Claims

1. A self-driling and setting rivet assembly including a sleeve member surrounding a mandrel member, the sleeve including an enlarged head portion at one end thereof adapted to abut the upper surface of a workpiece, the mandrel member having a shank portion with a drill point at one extremity thereof and shoulder means adjacent the drill point, the shoulder means having a transverse dimension greater than the inner diameter of the sleeve member to radially enlarge the sleeve as the mandrel is retracted upwardly relative to the sleeve, the drill point including a transverse dimension at least as great as the outer diameter of the sleeve to allow the sleeve to enter the aperture formed in a workpiece by the drill point, the shank having a weakened section of reduced cross-sectional area spaced upwardly from the shoulder means to allow the lower portion of the shank to be disassociated from the upper portion upon application of a predetermined tensile force to the shank, the sleeve positioned on the mandrel so as to surround the weakened shank section as well as portions of the shank



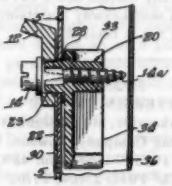
above and below the weakened section, the shank also including torque transmitting surface means located both above and below the weakened section, the inner peripherey of the sleeve including torque transmitting surface means adapted to cooperate with the torque transmitting surface means on the shank, the cooperating torque transmitting surface means and the sleeve portion intermediate the torque transmitting means above and below the weakened section of the shank forming means to bridge the weakened section and thereby increasing the torque accepting radius of the assembly in the region of the weakened section thereby enabling torque to be transmitted from the upper section of the shank to the drill point without subjecting the weakened section to appreciable torque forces.

3,935,787

DOOR HANDLE ANCHOR

Julian Vernon Fisher, Carpentersville, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 19, 1974, Ser. No. 480,724
Int. Cl.² A47B 95/02
U.S. Cl. 85—80 7 Claims



1. A door handle anchor for receiving a threaded fastener having predetermined pitch and major diameters to mount a handle thereto, comprising in combination; a body having a bore formed therein to receive a threaded fastener, said bore having a diameter equal to or less than said pitch diameter whereby rotative introduction of said fastener results in threads being formed in said body, a flange formed on said body transverse to the axis of said bore to overlie the periphery of an aperture formed in a door panel of relatively thin material, said aperture being located a predetermined dis-

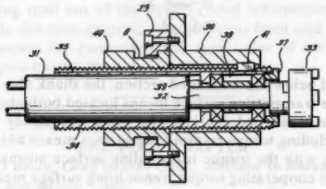
tance from a turned edge of said door panel, prong means formed integrally with said body and extending therefrom parallel to the axis of said bore and adapted for insertion into said aperture partially to extend through said panel, said prong means being sufficiently spaced apart so as to define an opening therebetween to freely receive the major diameter of the threaded end of said threaded fastener when in its initial condition and having a diameter an interconnecting section between said opening and said bore greater than said bore diameter, and an elongated arm portion formed integrally with said body and extending from said opening a distance greater than said predetermined distance, whereby said anchor will have the elongated arm portion thereof engaging said turned edge during tightening of said threaded fastener for holding the same in place while mounting the handle to the door panel.

3,935,788

PORTABLE MILLING TOOL

Guy T. Gilmore, Houston, Tex., assignor to Multi Fab. Inc., Houston, Tex.

Filed Sept. 23, 1974, Ser. No. 508,693
Int. Cl.² B23C *1/20*
U.S. Cl. 90—12 R **2 Claims**



1. In a portable milling tool, a rectangular framework, tracks formed in the longitudinal member of the framework and carriages mounted to move longitudinally in said tracks, transverse tracks mounted on said carriages and a cutter carriage mounted on said transverse tracks, a cutter adjustably mounted on said cutter carriage and means for moving said cutter carriage transversely or longitudinally as said cutter is actuated, said cutter comprising a motor having a drive shaft extending from one end and a cutter head mounted on said drive shaft, a tubular housing receiving said motor having a bearing chamber and a bearing supporting said drive shaft, and said housing being externally threaded to receive an adjusting nut, and an internally threaded collar mounted on said housing and movable by said nut, said housing having a keyway formed longitudinally therein and a key anchored to said collar and mounted in said keyway maintaining said housing against rotation as the nut is rotated.

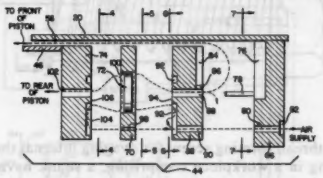
3,935,789

REVERSING VALVE

Alva Nelson Dorsey, Sykesville, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed July 19, 1974, Ser. No. 489,994
Int. Cl.² F01L *25/04*, *21/02*
U.S. Cl. 91—317 **17 Claims**

1. An air tool including a housing, an air motor in said housing including a cylinder having a piston reciprocable therein, an air inlet in said housing connectable to an air supply a working implement supported by said housing, an air control valve interposed between said air inlet and said cylinder to alternately provide pressurized air to opposite ends of said piston to cause said piston to reciprocate and to deliver blows to said working implement; said valve comprising a tandem arrangement of a base member, a middle member, a valve guiding member, and a cover member; a valve member reciprocable in an opening in said valve guide member, means to flow air from said air inlet to the opposite sides of said valve member, said flow means including port means in said middle member and said valve guide member communicating with first and second passage means, respectively, at opposite sides of said valve member, the cross-sectional area of said first and second passage means being greater than the cross-sectional area of said middle member port means and said valve guide member port means, respectively, whereby the flow of air from each said port means to its respective passage means is substantially unrestricted, the cross-sectional area of said valve guiding port means being in the range of from about 30% to about 75% of the cross-sectional area of said valve



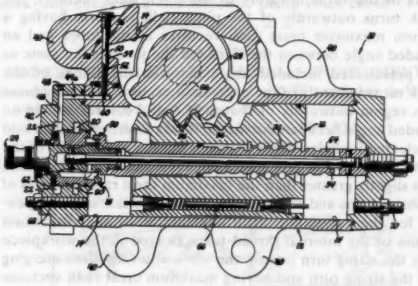
guide member port means, whereby to throttle the air as it passes through said valve guide member port means, whereby the air pressure at said second passage means is lower than the air pressure at said first passage means, first delivery means extending through said cover member to deliver the air from said second passage means under the control of said valve member to one end of said piston to power said piston through its working stroke, and second delivery means extending through portions of at least said middle member and said base member to deliver air from said first passage means under the control of said valve member to the opposite end of said piston to return said piston.

3,935,790

INTEGRAL POWER STEERING ASSEMBLY

Raymon L. Goff, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 11, 1974, Ser. No. 441,033
Int. Cl.² F15B *9/10*, *21/04*
U.S. Cl. 91—375 A **14 Claims**



1. An integral power steering assembly comprising; housing means defining a power cavity, piston means movably supported in said cavity, control valve means supported by said housing means for controlling pressurized fluid flow to said cavity and return fluid flow from said cavity to move said piston means in alternative and opposite directions, input shaft means for operating said control valve means, output means operatively connected to said piston means for movement thereby, mechanical means interconnecting said input shaft means and said piston means for moving said piston neans in response to rotation of said input shaft means in the event of lack of fluid pressure to move said piston means, and bleed valve means for automatically bleeding air from said cavity, said bleed valve means including bleed passage means extending from and in direct communication with said cavity,

a valve portion for controlling flow through said bleed passage means and movable between open and closed positions and normally open at any position of said piston means, biasing means for urging said valve portion toward said open position and away from said closed position in which said valve portion prevents flow through said bleed passage means, means in said bleed passage through said bleed passage means, a flow restriction in said bleed passage means normally open for allowing the free flow of air therepast and for creating a pressure differential between said bleed passage means upstream of said restriction and said bleed passage means downstream of said restriction in response to fluid flow therepast for moving said valve portion against said biasing means to said closed position to prevent flow of pressurized fluid past said valve portion in said closed position.

3,935,791

HYDRAULIC DRIVE FOR THE DIE CLOSING UNIT OF AN INJECTION MOLDING MACHINE

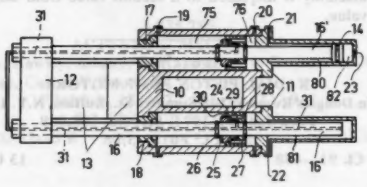
Karl Hehl, Arthur-Hehl-Strasse 32, 7291 Lossburg, Germany

Filed Jan. 31, 1975, Ser. No. 546,036

Claims priority, application Germany, Mar. 27, 1974, 2414668; Apr. 27, 1974, 2419314

Int. Cl.² F15B *11/02*

U.S. Cl. 91—411 R 29 Claims



1. In a hydraulic linear actuator of the cylinder and piston type, whose motion is switchable from a travel mode in which a movable assembly is advanced or retracted at accelerated speed and with comparatively little force to a power mode in which the assembly is subjected to a greatly increased pressure, when the piston is at or near one end of its travel stroke, which actuator is advantageously applicable as a drive for the die closing unit of an injection molding machine, the combination comprising:

a closed power cylinder with hydraulic connections at both extremities for double-acting operation;

a power piston fixedly seated on a piston rod and arranged for longitudinal travel inside said cylinder over the length of a piston stroke; the piston rod having a forward rod portion extending from the forward end of the power cylinder, which rod portion is connected to a movable assembly arranged for travel between an open position on one end of the piston stroke and a closed position on the other end of the stroke, and a rear rod portion extending from the opposite end of the power cylinder; and the power piston further dividing the space of the power cylinder into a high pressure space on that side of the piston which needs to be pressurized to urge the movable assembly into its closed position and a low pressure space on the opposite side of the piston;

a plurality of bypass channels extending generally axially across the body of the power piston from the high pressure side thereof to the low pressure side;

an annular valve seat on the power piston, on its high pressure side, arranged so as to surround the openings of the bypass channels;

a hollow valve plunger sealingly surrounding a cylindrical guide surface on the piston rod on the high pressure side of the power piston, said plunger being guided for axial motion toward and away from the power piston, between a closed position in which a shoulder of the valve plunger sealingly abuts against the valve seat and an open position located a distance away from said seat, and the valve plunger has at least one axial end face exposed to the fluid in the high pressure space;

means for moving the valve plunger between its open and closed positions in response to fluid pressure; and

an auxiliary cylinder cooperating with the rear piston rod portion so as to define a coaxial auxiliary linear actuator capable of driving the same movable assembly via the piston rod; and wherein:

the auxiliary cylinder has a much smaller hydraulically effective cross section than the power cylinder, so that, when the auxiliary cylinder is supplied with pressurized fluid while the valve plunger is in its open position, the piston rod and the movable assembly travel at a comparatively high rate of speed, while the power piston moves through the fluid contained inside the power cylinder, as the latter passes through its bypass channels from side to side of the power piston.

3,935,792

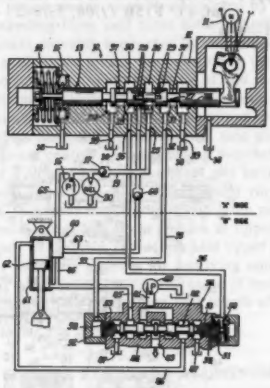
PILOT PUMP BLEED CONTROL FOR EARTHMOVING SCRAPERS

Joseph E. Dezelan, Joliet, and Henry J. Jessen, Wilmington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 335,910, Feb. 26, 1973, Pat. No. 3,862,643. This application June 26, 1974, Ser. No. 483,132

Int. Cl.² F15B *11/08, 13/042*

U.S. Cl. 91—438 3 Claims



1. In a pilot system including a hydraulic actuator controlled by an adjacent control valve, having a source of fluid pressure connected thereto, the latter valve being operated through a pilot control valve having its own pilot pump providing a source of fluid pressure for operating the control valve, a safety control system employing fluid pressure from said hydraulic actuator under load for emergency operations of the control valve comprising:

a safety valve body having a stepped axial bore therein;

a stepped spool means reciprocally mounted in said bore forming at least three separate chambers therein, including a first chamber having the largest spool reaction surface, a second chamber having a smaller spool reaction surface and a third chamber having the smallest spool reaction surface;

a pilot pump port in said valve body communicating with said first chamber with conduit means connecting said pilot pump port with the fluid pressure from said pilot pump;

an inlet port in said valve body communicating with said third chamber with conduit means connecting it with a side of said actuator under load;

a spool closable cylinder port in said valve body with conduit means connecting it to the opposite side of said

actuator under load, said cylinder intermediate port having fluid communication with said second chamber when said spool moves into said first chamber;

a spool closable valve port in said valve body with conduit means connecting it to the fluid supply port of the pilot valve, said valve port having fluid communication with said third chamber when said spool moves into said first chamber; and

a spool closable orifice means in said spool means having fluid communication with said third chamber and also with said second chamber when said spool moves into said first chamber, thereby providing restricted communication between said second and third chambers when pilot pump fluid pressure is lost, allowing said spool to move into said first chamber, whereby fluid pressure will be provided to the fluid supply port of said pilot valve for operating the control valve when pilot pump pressure is lost and the actuator under pressure will slowly bleed down due to the transfer of hydraulic fluid through the restricted orifice from the loaded side of the actuator to the unloaded side of the actuator.

3,935,793

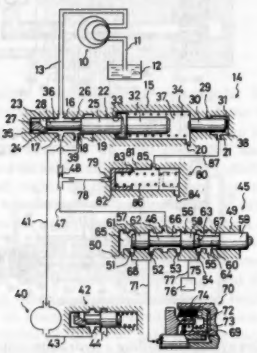
HYDRAULIC PRESSURE REGULATING SYSTEM

Noboru Murakami, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 280,217, Aug. 14, 1972. This application Apr. 10, 1974, Ser. No. 459,583

Int. Cl.[2] F15B *11/08, 13/042*

U.S. Cl. 91—446 **2 Claims**



1. A hydraulic pressure regulating system for a vehicle, comprising:

a source of fluid pressure;

a fluid actuated means;

a first fluid passage means between said fluid pressure source and said fluid actuated means;

a regulator valve assembly connected in said first fluid passage means, for regulating the fluid pressure, being discharged from said fluid pressure source through said fluid passage means to said fluid actuated means, to a first value, said regulator valve assembly including first and second pressure responsive piston faces;

a shift valve unit connected into said first fluid passage means between said regulator valve assembly and said fluid actuated means for activating and deactivating said fluid actuating means;

a restriction orifice disposed within said first fluid passage means for receiving said regulated pressure and for retarding the increase of fluid pressure in said fluid actuated means;

a second fluid passage means including first and second portions thereof for connecting said first fluid passage means between said orifice and said fluid actuated means to the second pressure responsive piston face of said regulator valve assembly, thereby to urge said regulator valve assembly in one direction in which the fluid pressure being regulated increases; and an accumulator connected in said second fluid passage means between said first and second portions and comprising a spring-biased slidable piston which normally closes said second fluid passage means, said piston always being continuously responsive to and pressurized by the fluid pressure retarded by said orifice via said first portion to thereby gradually increase the retarding fluid pressure in response to slidable movement of said piston, said second portion communicating with said second pressure responsive piston face at one end thereof and normally communicating with drain at the other end thereof and said piston opening communication between said first and second portions of said second fluid passage means when said retarding and gradually increasing fluid pressure exceeds a predetermined value by overriding said second portion and closing communication of said second portion with said drain, the fluid pressure conducted through said second fluid passage means acting on said second pressure responsive piston face and serving to move said regulator valve assembly in said one direction whereby the flluid pressure being regulated by said regulator valve assembly is increased to a second value from said first value.

3,935,794

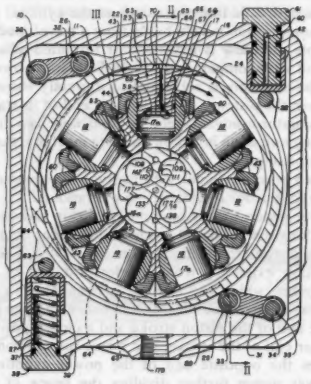
RADIAL PISTON PUMP/MOTORS

Rollin Douglas Rumsey, 148 Summer St., Buffalo, N.Y. 14222

Filed Jan. 20, 1971, Ser. No. 108,089

Int. Cl.[2] F01B *13/06*

U.S. Cl. 91—488 **13 Claims**



1. In a radial piston pump/motor structure including a housing providing a chamber with a shaft extending therefrom in relative rotary relation:

valve means carried by the housing within said chamber;

a rotor journaled within said chamber and operationally attached to the shaft;

arcuately surfaced pockets in the outer perimeter of said rotor;

cylinder members in said pockets having bearing surfaces complementary to and riding in angularly slideable relation on the pocket surfaces;

means secured to the rotor maintaining the cylinder members in the pockets;

each of said cylinder members having a radially outwardly opening cylinder bore within which is radially reciprocably mounted a piston projecting radially outwardly and

having on its radially outer end a shoe riding a surface within said enclosure facing toward said rotor;

means for effecting fluid communication between radially inner ends of said cylinder bores and said valve means and thereby with the radially inner ends of said pistons, and including respective ports at the radially inner ends of said cylinder members concentrically aligned with said cylinder bores and extending to and aligned with respective ports in said rotor and which rotor ports are of substantially smaller diameter than said cylinder bores and communicate with said valve means;

each of said cylinder members having an annular constriction providing the respective port at its radially inner end, said constriction providing seal retaining means; and

annular sealing means retained by said seal retaining means in assembly with said cylinder members in surrounding relation to said cylinder member ports and:

said sealing means being in fluid sealing engagement with the surface areas of said pockets surrounding said rotor ports;

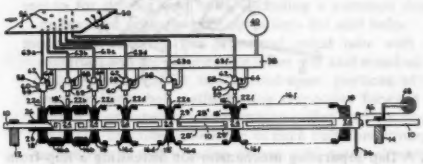
said sealing means being of substantially the same diameter as the diameter of said cylinder bores and maintaining a balanced sealing relationship between the cylinder members and said surface areas in all relative angular positions of the cylinder members and said surface areas.

3,935,795

ACTUATING MECHANISM

Jack S. Hawley, Albany, Calif., assignor to Pneumeric Corporation, Castro Valley, Calif.

Filed Feb. 22, 1972, Ser. No. 227,943
Int. Cl.² F01B *25/26, 31/12*
U.S. Cl. 92—5 R **3 Claims**



1. A precision actuating mechanism comprising a stationary shaft, slidably mounted upon said shaft a sequence of interconnected actuating components of predeterminably variable length axially of said shaft having limit stop means for limiting positively their condition of maximum axial length and their condition of minimum axial length, means selectively operable to adjust the axial length of said components individually to either their maximum axial length or their minimum axial length, means holding one end of said sequence of components against movement relative to said shaft, and means supported at the free opposite end of said sequence of components for indicating any changes of the sum total of the axial lengths of said components.

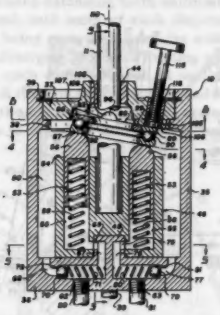
2. A precision actuating mechanism comprising a stationary shaft, a sequence of mechanically interconnected bellows slidably mounted upon said shaft in end to end relation having limit stop means for positively limiting the axial length of said bellows in their condition of maximum contraction and their condition of maximum expansion, means selectively operable to (adjust) set the axial length of said bellows individually to either their condition of maximum contraction or their condition of maximum expansion, means holding one end of said sequence of bellows positively against movement relative to said shaft, and means supported from the free opposite end of said sequence of bellows for indicating any changes in the sum total of the axial lengths of said bellows.

3,935,796

VARIABLE HYDRAULIC PUMPING APPARATUS

Robert A. R. Wood, West Vancouver, Canada, assignor to Teleflex Incorporated, North Wales, Pa.

Filed Apr. 16, 1974, Ser. No. 461,355
Int. Cl.² F01B *3/00*
U.S. Cl. 92—12.2 **10 Claims**



1. A hydraulic apparatus comprising: housing means, rotor means rotatably supported in said housing means for rotation about an axis, piston means movably supported by said rotor means and extending from said rotor means axially thereof, swash plate means movably supported by said housing means and engaging said piston means for controlling the length of stroke of said piston means per revolution of said rotor means, said swash plate means including a bearing assembly disposed about said axis and including parallel upper and lower plates with ball bearings disposed, therebetween, said plates being annular to define a central opening, a ring member disposed in engagement with said bearing assembly and having a body portion disposed in said opening therein, said ring member having arcuate trunnions integral with said body portion and extending laterally from said body portion in opposite directions transversely to said axis and across said upper plate, said housing means including grooves for receiving and rotatably supporting said trunnions to change the angle of inclination of said bearing assembly for controlling said length of stroke.

3,935,797

WEAR AND SEIZURE RESISTANT ALUMINUM ALLOY PISTON

Itaru Niimi, Nagoya; Yasuhisa Kaneko, Toyota; Yoshiro Komiyama, Okazaki; Masaaki Tokui, Toyota; Katsumi Kondo, Toyota, and Akio Kouno, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 8, 1973, Ser. No. 413,821
Claims priority, application Japan, Jan. 9, 1973, 48-5457
Int. Cl.² F02B *23/00*
U.S. Cl. 92—223 **9 Claims**

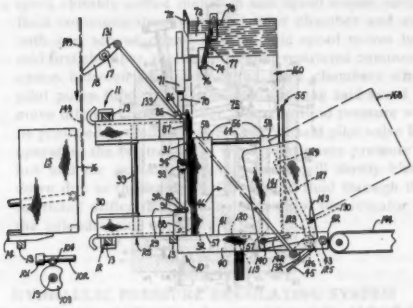
1. Aluminum alloy piston which is resistant to wear and seizing, at least the skirt of said piston being coated to a thickness of 0.4–0.7mm with a mixture consisting essentially of both iron and discrete particles of carbon, but containing at most 0.3% by weight of said carbon particles.

3,935,798

CONTAINER ASSEMBLING MACHINE

Gerald C. Paxton, Sanger, Calif., assignor to SWF Machinery, Inc., Sanger, Calif.

Filed Feb. 4, 1974, Ser. No. 439,145
Int. Cl.² B31B 17/74, 17/02
U.S. Cl. 93—39 R 22 Claims



11. In a container assembling machine having a die assembly, a container assembly position and being adapted successively to form first components in said die assembly and subsequently to thrust said components through the die assembly along a predefined path of travel into the assembly position and having a source of second components disposed in feeding relation to the assembly position, said second components having endwardly interconnected walls with extended flaps having slots between the flaps and the components folded into a substantially flat configuration to position selected walls in leading and trailing relation and in substantial facing engagement with predetermined slots in offset relation, an improvement comprising guide members pivotally mounted intermediate the die assembly and the assembly position for movement between positions substantially transverse to said path of travel and positions substantially parallel to the path of travel; finger means borne by the machine in the assembly position adjacent to the source and in juxtaposition to a predetermined slot of the adjacent second component; and means, including a grasping member mounted on the machine for movement between an extended, wall engaging position and a retracted component erecting position, for grasping a selected leading wall of said second component and drawing said wall into the assembly position and the predetermined slot about the finger means for engagement of said finger means with the flap of the trailing wall to unfold said second component into first component receiving relation in the assembly position.

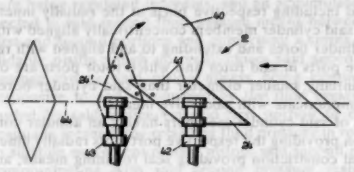
3,935,799

APPARATUS FOR MAKING ENVELOPES WITH BROAD OR POINTED CLOSURES FROM A PAPER WEB

Kurt Stemmler, and Günter Ehlscheid, both of Neuwied, Germany, assignors to Winkler & Dunnebier, Neuwied, Germany

Filed Feb. 28, 1974, Ser. No. 447,009
Claims priority, application Germany, Mar. 5, 1973, 2310944
Int. Cl.² B31B 19/02
U.S. Cl. 93—61 R 3 Claims

1. In a machine for optionally manufacturing card and banker envelopes for use with a processing device, an apparatus for turning the blanks parted from a continuously fed paper web, which lie with their diagonals at an inclination to the longitudnal axis of the machine and are conveyed one after the other in the longitudinal axis of the machine, said apparatus comprising a turntable which is disposed in the conveying plane of the blanks, rotates in dependance on the machine speed and is disposed with its axis of rotation outside the axis of symmetry of the machine, means having a plurity of suction air bores adapted to engage the blanks, a segmental



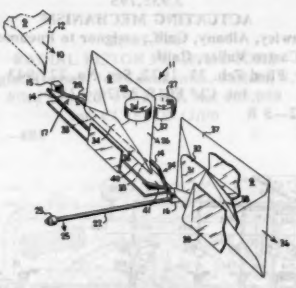
roller disposed upstream of the turntable to feed the blanks, and a segmental roller disposed downstream of the turntable to receive the turned blanks.

3,935,800

FLAP SEPARATING MECHANISM

Paul R. Sette, Hamden, Conn., and Anthony Storace, Tarrytown, NY, assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 8, 1974, Ser. No. 459,037
Int. Cl.² B31B 1/36, 49/04
U.S. Cl. 93—61 R 8 Claims



1. A flap separating mechanism for distending a flap from a body portion of an unsealed envelope moving along a feed path of a mail handling system with a substantially vertical orientation, said flap separating mechanism including means to separate the flap from the envelope body portion and then guide the flap and said body portion of the envelope about a guide member, said flap separating mechanism comprising:

means defining an envelope feed path wherein the envelope is transported with a substantially vertical orientation;

transporting means associated with said feed path for transporting envelopes along said feed path with said substantially vertical orientation;

a substantially flat envelope guide member vertically disposed within said feed path for receiving and engaging with an unsealed envelope moving along said feed path, said guide member receiving and maintaining the unsealed envelope with the flap distended from the body portion of said envelope such that said flap will be guided about one side of the guide member and the body portion of the envelope will be guided on an opposite side of said guide member; and

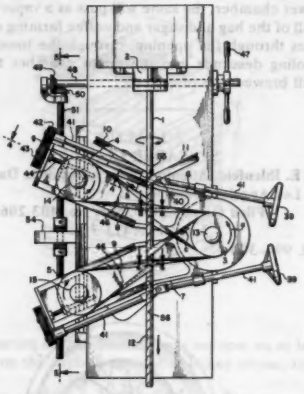
force exerting means disposed along feed path ahead of said envelope guide means for receiving an envelope moving along said feed path, said force exerting engaging with, and exerting a force substantially along the entire body portion of an envelope adjacent said flap such that said body portion will be made to flex, the flap of said envelope being caused to distend from said body portion as said body portion is made to flex.

3,935,801

APPARATUS FOR MANUFACTURING SPIRAL TUBES

Kakumichi Okazaki, 4-15, Zuiko-dori, Higashiyodogawa, Osaka, Japan

Filed Nov. 8, 1973, Ser. No. 414,059
Int. Cl.² B31C *3/00*
U.S. Cl. 93—80 **1 Claim**



1. The apparatus for manufacturing continuous lengths of spiral tubes wound with at least two tape-like materials, the apparatus comprising in combination:

a mandrel;

two belts supported for running along two separate paths crossing at angles and spaced from each other;

means for driving said belts, including a common driving pulley, and separate take-up pulleys for said belts;

means for covering the processed spiral tube with said material, and for pressing the latter and said mandrel into tight engagement at two spaced-apart portions of said mandrel; said belt paths having respective forward and return runs between said common pulley and the respective take-up pulleys, one run of each belt constituting an active run in said pressing means; said mandrel portions having trained therearound, respectively from below and from above, one convolution of the active forward run of one belt and another convolution of the active return run of the other belt, thereby imparting to said mandrel pressing forces in the same circumferential direction at both said mandrel portions although pulling forces result in the oppositely moving active runs of said belts;

means for adjusting the angles of said belts relative to the axial direction of said mandrel and the spiral tube being formed thereon; said adjusting means including a threaded rod having two sections with oppositely directed threads thereon;

control arms movable along said sections, which arms respectively support said take-up pulleys; and

means for rotating said threaded rod, thereby to adjust said relative angles of the belts.

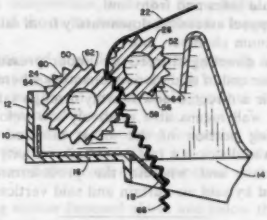
3,935,802

CONSTRUCTION AND METHOD OF DISPENSING CRIMPED PAPER TOWELING

Jack Louis Perrin, Los Angeles, and Stanley Theodore Christensen, San Gabriel, both of Calif., assignors to Towlsaver, Inc., Los Angeles, Calif.

Filed July 30, 1974, Ser. No. 493,349
Int. Cl.² B31D *5/04*; **B65H** *45/16*
U.S. Cl. 93—84 R **6 Claims**

1. In a dispenser of the type having a paper toweling supply directing a web of paper toweling between a radially abutting, selectively rotatably driven set of dispensing rolls and from the dispenser for dispensing the paper toweling web; the improvements comprising: mounting means mounting at least one of said dispensing rolls radially movable relative to the other of said dispensing rolls; resilient means operably connected constantly resiliently urging said dispensing rolls radially into said roll abutment; each of said dispensing rolls having a plurality of generally axially extending teeth uniformly about a circumference thereof, said teeth of each dispensing roll in radial cross-section being generally triangular with sides converging to crests and diverging to valleys forming voids therebetween; said teeth of each dispensing roll at said roll abutment and during said roll rotation fully matching and fully interengaging said teeth of the other dispensing roll against said paper web therebetween as urged by said resilient means, each of said



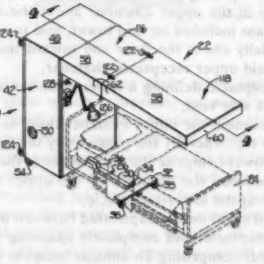
teeth crests of each of said dispensing rolls engaging fully and forcing said paper web fully into and against said teeth valleys of each of said dispensing rolls; surface means on said teeth having portions thereof at all times compressively abutting said paper web regardless of the rotatable positioning of said rolls and without regard to said roll rotation as urged by said resilient means resisting movement of said paper web through said dispensing rolls without roll rotation; said interengaged teeth of said dispensing rolls at said roll abutment as resiliently urged and during said roll rotation cooperating to compressively abut and relatively sharply permanently foldably deform said paper web over said teeth crests and fully inwardly against said teeth valleys to permanently foldably crimp said paper web; said dispensing rolls during said roll rotation dispensing said relatively sharply folded crimped paper web from said dispenser.

3,935,803

AIR FILTRATION APPARATUS

Louis Bush, Beaufort, S.C., assignor to Flanders Filters, Inc., Washington, N.C.

Filed Oct. 12, 1972, Ser. No. 296,846
Int. Cl.² F24F *13/00*
U.S. Cl. 98—36 **13 Claims**



1. An apparatus for directing a filtered stream of air downwardly onto a predetermined area such as a hospital bed or the like, and with the periphery of the stream of air moving at a

higher velocity than the central portion thereof to thereby form a peripheral air curtain to prevent the incursion of unfiltered air into the predetermined area and thus effectively isolate such area from the external environment while maintaining free access thereto, said apparatus comprising

a horizontally disposed plenum chamber comprising a closed front end, an open rear end, opposite sides, perforated bottom wall means comprising an openwork screen and fibrous air permeable means resting upon and substantially covering said openwork screen for permitting air to be passed uniformly therethrough while reducing its velocity, and means defining a downwardly directed, continuous, open slot extending along each side and the front end and peripherally of said bottom wall means,

means for supporting said plenum chamber above the predetermined area and in cantilever fashion from said open rear end such that the plenum chamber is unsupported along said sides and front end,

a vertical panel extending downwardly from said rear end of said plenum chamber, and

means for directing filtered air under pressure into said open rear end of said plenum chamber whereby a portion of the air is directed downwardly through said perforated bottom wall means at a relatively low velocity and the remaining portion of the air is directed downwardly through said slot at a relatively high velocity to define an air curtain and wherein the predetermined area is bounded by said air curtain and said vertical panel.

3,935,804

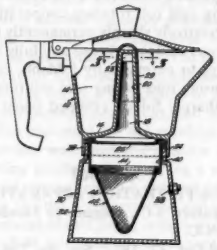
COFFEE BREWER

Thomas Perez, 3310 NW. 9th Court, Miami, Fla. 33127

Filed Jan. 28, 1975, Ser. No. 544,842

Int. Cl.² A47J *31/057*

U.S. Cl. 99—293 **3 Claims**



1. A coffee brewer comprising:

an upper receptacle defining an upper chamber with a floor having an opening and an opened top tower extending vertically in the upper chamber about the opening and filter means included on said tower, said tower extending substantially above the floor and toward the upper portion of said upper receptacle chamber,

a lower receptacle defining a lower chamber with an open top and a side vent,

means to connect the upper chamber floor over the lower chamber top, whereby the passageway through the opening and tower comprise the only means of fluid communication between the chamber of the upper end and the chamber of the lower receptacle,

a coffee and sugar holder captivated between the upper and lower receptacle, and completely spanning the opening, said holder comprising an annular member sized to nest in the open top and means captivating the holder in the open top of said upper receptacle, and a bag suspended from said annular member and extending into the lower chamber to hold a lower charge of sugar and an upper charge of coffee, said bag having an open upper end in said opening and a closed lower end,

expandible ring means carried by the open upper end of the bag and releasably engaged in said annular member to suspend said bag in said lower chamber,

whereby when a charge of sugar and an upper charge of coffee is placed in the bag, and the bag is suspended on said holder, and the receptacles are united together captivating the bag and heat is applied to boil water in the lower chamber, the same will pass as a vapor through the wall of the bag and sugar and coffee forming coffee which rises through the opening, through the tower, and upon cooling descends into the upper chamber to provide a well brewed cup of coffee.

3,935,805

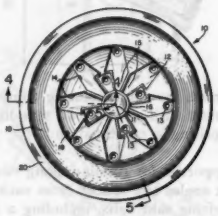
SPREADER CLOSURE

Russell E. Ihlenfeld, Allenton, Wis., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Oct. 3, 1973, Ser. No. 403,206

Int. Cl.² A47J *31/44*

U.S. Cl. 99—300 **3 Claims**



1. A spreader closure for receiving and distributing hot water in a coffee maker apparatus or the like comprising:

a central water receiving portion;

a downwardly inclined surface having upper and lower portions, said surface extending outwardly from said central water receiving portion to an upstanding peripheral wall;

at least two sets of individual orifices located on said downwardly inclined surface to pass water through said spreader closure including a first set of said orifices positioned radially outwardly from a second set of orifices with respect to said central water receiving portion and each orifice of said first set of orifices being angularly displaced from each orifice of said second set of orifices such that the hot water is substantially evenly distributed;

divider means extending upwardly from the upper portion of said downwardly inclined surface and radially outwardly from said central water receiving portion wherein each of said divider means is about equally angularly spaced apart about the periphery of said water receiving portion to define separate water flow channels for each of said orifices and each channel communicating and directing water flow to only a single orifice.

3,935,806

SMOKELESS BARBECUE UNIT

Timothy J. Connolly, Vallejo, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 21, 1974, Ser. No. 453,267

Int. Cl.² A47J *37/07*

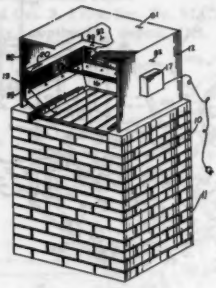
U.S. Cl. 99—340 **2 Claims**

1. A barbecue unit for broiling food comprising

a hollow chimney base section, with a first grill mounted over the top of the recess of the chimney base,

a housing mounted on the top of the sides of the base section, above the said first grill, formed of three sides and a top section,

a firebox mounted on the interior of each of the three sides of the housing, the firebox being open on its top face and fitted with a screen mesh bottom, together with an inclined tray member mounted to each inner side wall of the housing below the firebox, said tray member extending from a side wall to terminate over the recess of the



hollow recess of the chimney base section, so as to carry ashes from the firebox into the chimney recess, together with

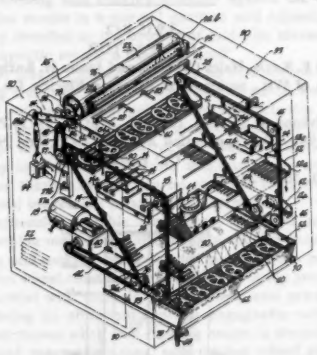
a food-supporting second grill which is of an inverted V-shape, formed of two flat grill segments that are each inclined to the plane of the other, and join at the apex of the said second grill so that a strip of food may hang from the apex of the said second grill and rest on each of the said second grill segments.

3,935,807

AUTOMATIC BAKING APPARATUS

Bertyl L. Main, Spokane, and Richard G. Garmire, Kirkland, both of Wash., assignors to G & M Enterprises, Kirkland, Wash.

Filed July 10, 1974, Ser. No. 487,312
Int. Cl.[2] A21B *5/06*
U.S. Cl. 99—352 **14 Claims**



1. An apparatus for baking a pretzel-like bakery product, comprising:

a housing having an oven-like chamber therein;

a pair of endless power-driven drive belts mounted in the chamber so as to rotate therein in spaced parallel vertical planes around closed paths of travel each comprising a first substantially horizontal segment disposed near the top of the chamber, a second substantially horizontal segment disposed near the bottom of the chamber, said second horizontal segment being substantially shorter than said first horizontal segment, each of said first and second horizontal segments having first and second ends, said closed paths of travel further including a substantially vertical segment and an oblique segment, said vertical segment being disposed adjacent the front of the chamber and connecting the respective first ends of said first and second horizontal segments, said oblique segment being disposed towards the rear of the chamber and connecting the respective second ends of said first and second horizontal segments;

a plurality of carrier racks interposed between the drive belts and swingably supported at spaced points therealong so that a baking surface of each rack maintains a substantially horizontal disposition as the racks are rotated in conjunction with the drive belts, said baking surface of the racks being adapted to support a bakery product;

means positioned in said housing for spraying a solution on the bakery product when each rack is disposed at a point near the bottom of the vertical segments of the closed paths of travel of the drive belts;

means positioned in said housing for salting the upper surface of the bakery product at a point in the course of travel thereof after each rack has passed said spray point; and

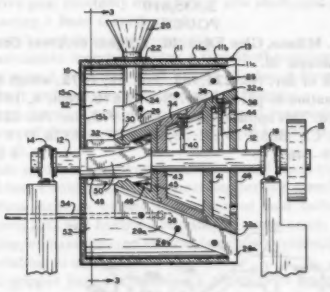
dual baking means disposed above and below the course of travel of said racks at a point after said salting point for baking the bakery products.

3,935,808

APPARATUS FOR MILLING GRAIN WHILE SIMULTANEOUSLY COOKING THE GRAIN

Fausto Celorio Mendoza, Cumbres de Acultzingo No. 185, Lomas de Chapultepec, Mexico City, Mexico

Filed Sept. 5, 1974, Ser. No. 503,488
Claims priority, application Mexico, Sept. 21, 1973, 146302
Int. Cl.[2] A23L *1/34, 1/36;* B02B *5/02*
U.S. Cl. 99—353 **7 Claims**



1. An apparatus for milling grain while simultaneously cooking the grain which comprises; an outer nonrotatable frustoconical grinding member; an inner rotatable frustoconical grinding member coaxial with and substantially axially coextensive with said outer member, said grinding members defining an annular grinding space therebetween, an insulated enclosure surrounding said outer grinding member and defining a closed space therewith, means for supplying grain to be ground to said grinding space near one end of said members for movement axially along said space to a point of discharge at the other end of said members, means for supplying hot gas to said closed space thereby to heat said outer grinding member, and means for moving hot gas from said closed space

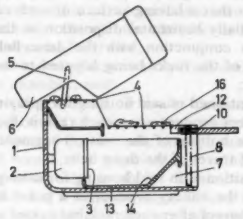
axially through said inner grinding member to heat said inner grinding member.

3,935,809

GRILLING APPARATUS USABLE AS A SPACE HEATING MEANS

Hans Bauer, Dettingen, Germany, assignor to Dietz-Druckguss KG, Unterensingen, Germany

Filed July 22, 1974, Ser. No. 490,481
Claims priority, application Germany, Aug. 1, 1973, 7328066[U]
Int. Cl.² A47J 27/66
U.S. Cl. 99—447 3 Claims



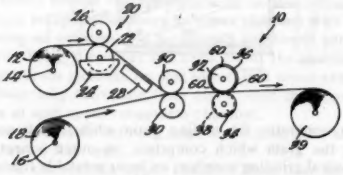
1. A grilling apparatus comprising, in combination, a grilling tub having an upper grilling portion and a selectably openable front wall, a hood coupled to the tub and adjustable from a closed position to a desired open position above the grilling portion, heating means disposed in the tub and having a vertically arranged heating plane for radiating heat forwardly toward the first wall of the tub, and means removably insertable into the tub through the front wall for deflecting the forwardly radiated heat upwardly toward the grilling portion.

3,935,810

POUCHES

Gerard M. Milano, Glen Ellyn, Ill., assignor to Arvey Corporation, Chicago, Ill.

Division of Ser. No. 221,982, Jan. 31, 1972, which is a continuation-in-part of Ser. No. 69,670, Sept. 4, 1970, abandoned. This application Nov. 30, 1973, Ser. No. 420,617
Int. Cl.² B65D 79/00, 85/67, 85/72; B32B 7/14
U.S. Cl. 99—467 4 Claims



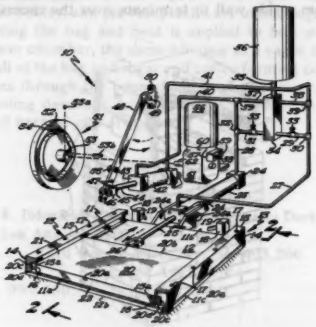
1. A cooking and sterilizing bag and bag roll comprising a pair of films secured together at least at two opposite edges, one film being a plastic film capable of resisting cooking temperatures, the other film being a metallic foil, and an adhesive securing the opposite edges together which adhesive is capable of withstanding cooking temperatures without separation of the films.

3,935,811

BOLSTER TABLE DEVICE FOR PUNCH PRESS

John O. Lenz, Coon Rapids, and Ingo E. Wolfe, Minneapolis, both of Minn., assignors to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Sept. 16, 1974, Ser. No. 506,412
Int. Cl.² B30B 15/06, 15/30
U.S. Cl. 100—53 10 Claims



1. A bolster table device for a punch press apparatus of the type having a power operated press, vertically shiftable through a working cycle into and out of engaging relation with a workpiece on the bolster table device, said bolster table device comprising:

a stationary support plate,

spaced apart, substantially parallel elongate guideways,

a bolster table engaging said guideway for reciprocating movement between an outer extended position and an inner retracted position disposed below the press to permit a workpiece to be engaged by the latter,

means for reciprocating said bolster table through a cycle between said outer extended position, to the inner retracted position, and for return to the outer extended position, said reciprocating means including a closed circuit fluid pressure system, a driven cam mechanism operatively connected with said pressure system for operating the latter and

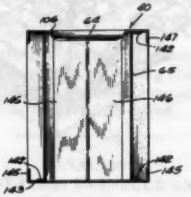
means for driving said driven cam mechanism.

3,935,812

COMPACTOR

Robert F. Karls, Hales Corners, and James H. Enright, Racine, both of Wis., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 177,385, Sept. 2, 1971, Pat. No. 3,772,984. This application Apr. 23, 1973, Ser. No. 353,921
Int. Cl.² B30B 1/00
U.S. Cl. 100—214 3 Claims



1. A trash compactor having a housing with unitary frame and body, said housing having panel surfaces with side margins turned at a right angle to form edge flanges, and transverse panel walls having margins in face contact with said

flanges and fastened thereto, edge portions of said transverse panel walls being bent at a right angle to form flanges parallel to the first-named panel surfaces to form box section corner posts for the housing.

3,935,813

PRINT HAMMER DEVICE

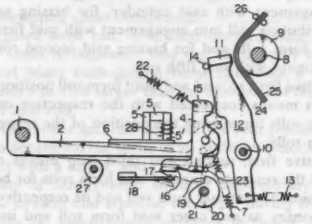
Toru Matsubara, Chofu, Japan, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Chofu, Japan

Filed Oct. 3, 1974, Ser. No. 511,728

Claims priority, application Japan, Oct. 11, 1973, 48-114100

Int. Cl.[2] B41J 9/36

U.S. Cl. 101—93.31 1 Claim



1. A printing device comprising in combination

a. a driven rotatable print drum having a plurality of raised type faces arranged circumferentially at spaced intervals thereon;

b. printing hammer means rotatably mounted for rotation around an axis parallel with the axis of rotation of said print drum, to abut against and move away from the respective type faces on said drum;

c. rocking means one end of which is rotatably mounted for rotation around an axis parallel with the axis of rotation of said drum and having a portion opposed to said printing hammer;

d. bias means resiliently biasing said rocking member in a direction toward said printing hammer;

e. magnetic means adjacent said rocking means for attractively holding said rocking member against the bias of said bias means in a normal position and releasing said rocking member to the control of said bias means when said magnetic means is demagnetized;

f. actuator means rotatably mounted on said portion of said rocking means for rotation about an axis parallel with the axis of rotation of said print drum, said actuator means having therein an abutment spaced from said printing hammer means when said rocking means is attractively held by said magnetic means, and having an engaging member thereon which can be engaged for preventing rotational movement of said actuator means;

g. intermittently rotatable cam means disposed adjacent said rocking means for engaging said rocking means and moving said rocking means toward said magnetic means;

h. a ratchet wheel rotatably mounted for rotation around an axis parallel with the axis of rotation of said print drum and having an abutment thereon engageable with said actuator means when said rocking means is moved away from said magnetic means, said ratchet wheel pivoting said actuator means against said printing hammer means for causing said printing hammer means to strike the type on said print drum when said actuator means is operatively engaged by the abutment on said ratchet wheel; and

k. detent means adjacent said engaging member on said actuator means for engaging said engaging member at the end of the pivoting movement of said actuator means for holding said actuator means out of the rotational orbit of said abutment on said ratchet wheel, and for releasing said engaging member upon the movement of said rocking means by said cam means toward said magnetic means.

3,935,814

SHEET DELIVERY APPARATUS

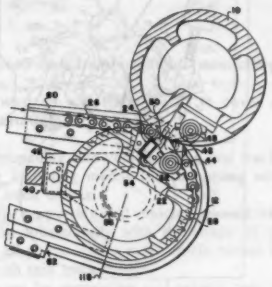
Willi Weisgerber, Johannisberg-Rheingau, Germany, assignor to Miller Printing Machinery Co., Pittsburgh, Pa.

Filed Feb. 19, 1974, Ser. No. 443,430

Claims priority, application Germany, Feb. 19, 1973, 2308025

Int. Cl.[2] B41F 21/08

U.S. Cl. 101—232 4 Claims



1. Sheet delivery apparatus for a sheet fed printing press comprising,

a cylindrical sheet supporting member positioned parallel to an impression and blanket cylinder of a printing press,

said cylindrical sheet supporting member having a shaft journaled in a press frame,

a drive gear rotatably mounted on said shaft, said drive gear having a bore therethrough,

means to rotate said drive gear,

an eccentric member having a first shaft positioned in said bore and a second shaft axially displaced from said first shaft and nonrotatably connected thereto,

clamp means rotatably connecting said eccentric member second shaft to said cylindrical sheet supporting member shaft,

a pair of drive sprockets secured to said shaft on opposite sides of said cylindrical sheet supporting member,

endless delivery chains reeved about said delivery drive sprockets and having a plurality of transversely extending gripper bars secured therebetween in preselected spaced relation to each other,

said gripper bars each having a plurality of gripper fingers and gripper pads arranged to engage the front edge of a sheet therebetween,

said cylindrical sheet supporting member having a recessed portion to receive said gripper bars as said gripper bars revolve about the axis of said shaft,

an arm member connected to said eccentric member first shaft and having a cam roller mounted thereon,

a cam member fixedly secured to said press frame, and

said cam member arranged to oscillate said arm member upon rotation of said drive gear to thereby oscillate said eccentric member to rotate said sheet supporting member and vary the angular velocity of said shaft and maintain the speed of said gripper pads on said gripper bars equal to the peripheral velocity of said impression and blanket cylinders until the trailing edge of the sheet passes through the nip of said impression and blanket cylinder.

3,935,815
INKING APPARATUS FOR PRINTING PRESS

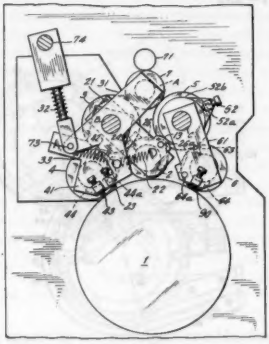
Karl Olov Keijser, Vasteras, Sweden, assignor to AB Printing Equipment, Sollentuna, Sweden

Continuation-in-part of Ser. No. 453,865, March 22, 1974, abandoned, which is a continuation of Ser. No. 297,238, Oct. 13, 1972, abandoned. This application Mar. 12, 1975, Ser. No. 557,833

Claims priority, application Sweden, Oct. 21, 1971, 13371/71

Int. Cl.[2] B41F *31/30*

U.S. Cl. 101—349 5 Claims



1. An inking apparatus for uniformly inking a rotatable cylinder, comprising:

a support frame;

first, second and third rotatable form rolls, aligned with each other and spaced apart from but near to each other and arrayed around said cylinder and all rollingly engaging said cylinder; a respective first, second and third pivot on which said first, second and third rolls are rotatably mounted, and the locations of these said pivots being adjustable;

fourth and fifth rotatable distribution rolls, aligned with each other and also with said form rolls; said distribution rolls being spaced from each other; a fourth pivot on which said fourth roll is rotatably mounted; the location of said fourth pivot being adjustable; a fifth pivot on which said fifth roll is rotatably mounted; said fifth pivot being fixedly located with respect to and attached to said frame;

said fourth distribution roll being continuously in engagement with both said first and said second form rolls for rolling therewith; said fifth distribution roll being continuously in engagement with both of said second and said third form rolls for rolling therewith; whereby there are four continuously engaged contact points between said form rolls and said distribution rolls for effective ink distribution;

a sixth rotatable transfer roll for receiving ink from a source, a sixth pivot on which said sixth roll is rotatably mounted; said sixth roll being spring biased against said fourth and fifth distribution rolls and the location of said sixth roll being self adjustable against said fourth and fifth rolls and in continuous engagement with both said fourth and fifth rolls for their rolling together;

a seventh pivot generally aligned with said sixth pivot and being fixedly located with respect to and attached to said frame;

a first arm journaled for swinging motion about said seventh fixed pivot and extending toward said fourth pivot; said fourth pivot being located on said first arm, and said fourth roll being carried on said first arm and being rotatable with respect thereto;

a second arm journaled for swinging motion about said fourth pivot and extending toward said first pivot; said first pivot being located on said second arm and said first roll being carried on said second arm and being rotatable with respect thereto;

a third arm journaled for swinging motion about said fourth pivot and extending toward said second pivot; said second pivot being located on said third arm and said second roll being carried on said third arm and being rotatable with respect thereto;

a fourth arm journaled for swinging motion about said fifth pivot and extending toward said third pivot; said third pivot being located on said fourth arm and said third roll being carried on said fourth arm and being rotatable with respect thereto;

a plurality of biasing means for biasing said form rolls into engagement with said cylinder, for biasing said fourth distribution roll into engagement with said first and second form rolls and for biasing said second roll into engagement with said fifth roll;

respective first, second and third form roll position readjustment means connected with the respective one of said form rolls for moving the position of the respective said form rolls;

respective first, second and third stop means connected with the respective one of said form rolls for holding the position of that said form roll and its respective said arm stationary as any other said form roll and its said arm shifts in position.

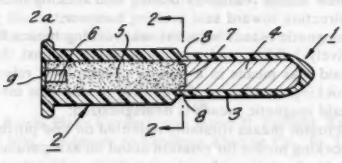
3,935,816
CONSTRUCTION FOR CARTRIDGE

Lawrence E. Boquette, Jr., Long Beach, Calif., assignor to Howard S. Klotz, New York, N.Y.

Filed Jan. 9, 1974, Ser. No. 431,949

Int. Cl.[2] F42B *5/22*

U.S. Cl. 102—41 6 Claims



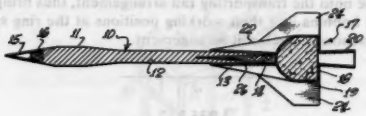
1. A live ammunition cartridge comprising, in combination: a cylindrical powder charge body having a constant diameter, a primer disposed in one end of said powder charge body, an elongated cylindrical and continuous sheath of plastic material having an axial bore of said constant diameter; a first portion of said elongated plastic sheath bore closely receiving said powder charge body with said primer being juxtaposed with one end of said elongated plastic sheath; a second portion of said sheath having an elongated projectile-shaped section which is closed at its end and which extends axially away from said powder charge body; a projectile mass disposed within and completely filling said constant diameter bore in said projectile-shaped sheath section; said first plastic sheath portion having a wall thickness sufficiently strong to withstand the forces due to expanding gas created when said powder charge is ignited by said primer; said second plastic sheath portion having a substantially constant wall thickness, said second portion wall thickness being less than said first portion wall thickness; said first plastic sheath portion being ejected with said projectile mass when said powder charge body is ignited.

3,935,817

PENETRATING SPEAR

Carlo Riparbelli, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Continuation-in-part of Ser. No. 172,335, July 28, 1971, abandoned. This application Jan. 22, 1973, Ser. No. 325,716
Int. Cl.[2] F42B *11/14*
U.S. Cl. 102—52 4 Claims



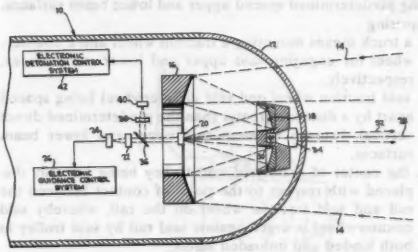
1. A penetrating spear comprising:
an elongated solid rod, of a hard metal, having a length many times its diameter, said rod additionally having an integral blunt bulb-shaped front end with a diameter between 5 to 10% larger than the diameter of the remainder of said rod;
propulsion means secured adjacent the rear portion of said rod to accelerate the spear to an optimum velocity before impact with a target; and
a plurality of aerodynamic surfaces disposed around said rod to control and stabilize the spear during flight, said plurality of aerodynamic surfaces including a frontal conical fairing disposed at the front of said rod, a plurality of aerodynamic fairing surfaces extending from said rod to said propulsion means, and a plurality of stabilizer tail surfaces extending outward from said propulsion means.

3,935,818

COMBINED FUZE AND GUIDANCE SYSTEM FOR A MISSILE

Peter B. Johnson, Washington, D.C., and Edward A. Brown, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,840
Int. Cl.[2] F42C *13/02;* F42B *15/02*
U.S. Cl. 102—70.2 P 4 Claims



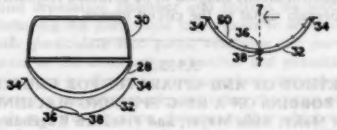
1. In an optical guidance system target sensing head for a missile incorporating an assembly of optical elements for receiving radiant energy from a target, and wherein the optical axis of the receiving assembly is automatically rotated by guidance control means in response to received guidance radiation to track the target, the improvement comprising; an active optical fuze means for detonating a missile warhead at a prescribed range, said fuze means including a radiant energy transmitting device coupled to the receiving assembly and disposed coaxially therewith for emitting radiation outwardly along the optical axis of the receiving assembly, whereby the fuze radiation is automatically emitted in the target direction when the receiving assembly is rotated to track the target; and a discriminator means coupled to the receiving assembly for separating received fuze transmitter radiation scattered by the target from received guidance radiation.

3,935,819

MASS TRANSPORTATION

Bradley R. Klein, 855 Piccadilly Circle, Sacramento, Calif. 95825

Filed May 7, 1974, Ser. No. 463,068
Int. Cl.[2] B61D *15/00*
U.S. Cl. 104—23 FS 4 Claims



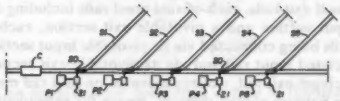
1. A high speed mass transportation system comprising:
track means;
means mounted on said track means to cover said track means with a film of liquid;
a vehicle;
means for propelling said vehicle along said track means;
said vehicle including means for supporting said vehicle over said track means;
said means for supporting said vehicle over said track means conforming substantially with the shape of said track means at all points where said vehicle comes in or near contact with said track means;
and said means for supporting said vehicle over said track means and said track means are substantially smooth at all points where said means for supporting said vehicle and said track means meet.

3,935,820

APPARATUS FOR THE IDENTIFICATION OF MOVING UNITS

Dean Lancaster, Lakewood, Colo., assignor to Control Electronics Corporation, Golden, Colo.

Filed Aug. 5, 1974, Ser. No. 494,459
Int. Cl.[2] B61J *3/00*
U.S. Cl. 104—88 9 Claims



1. An apparatus to identify car units moving along a fixed course for subsequent switching or like purposes, comprising:
a. a signal indicator means on the moving car unit which is tuned to resonate at a frequency which is permitted to vary only by a small percentage from a selected base frequency,
b. a signal pickup means adjacent to the fixed course including an oscillator means producing a radiation field which extends to and is within the influence of the signal indicator means whenever the car unit moves past the signal pickup means,
c. a sweep control means controlling the frequency of the signal pickup means and cyclically varying the frequency of the radiation field produced by the signal pickup means from the aforesaid selected base frequency through a range of frequencies, above and below the selected base frequency, which is slightly greater than the permitted variation of the resonant frequency of the aforesaid signal indicator from the said base frequency,

whereby the signal pickup means will operate at the resonant frequency of the signal indicator means twice during each sweep cycle and thereby whenever the signal indicator means is within the influence of the radiation it causes a repeated distortion of said radiation field and a distortion of the voltage pattern within the signal pickup means,

d. a circuit means associated with the signal pickup means to provide a signal and which is responsive only to a repeated distortion of the voltage pattern in the signal pickup means, and

e. a control means adapted to be actuated responsive to the aforesaid signal by the circuit means.

3,935,821

METHOD OF AND APPARATUS FOR CREELING BOBBINS ON A RING SPINNING MACHINE

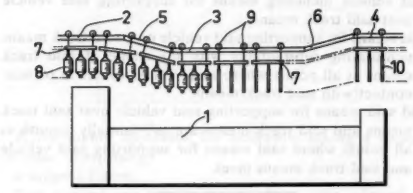
Helmut Maier; Alois Mayer, and Friedrich Kugelmann, all of Augsburg, Germany, assignors to Augsburger Kammgarn-Spinnerei AG, Augsburg, Germany

Filed June 25, 1973, Ser. No. 373,452

Claims priority, application Switzerland, June 28, 1972, 9673/72

Int. Cl.[2] B61B *3/00*

U.S. Cl. 104—89 25 Claims



1. An apparatus for creeling bobbins into a working position at a ring spinning machine, comprising rail means arranged above the ring spinning machine, said rail means extending substantially parallel to the longitudinal axis of the ring spinning machine and comprising input rails, creel rails and exit rails, wherein said creel rails are arranged at a lower height than the input rails and exit rails, each of said creel rails having operatively associated therewith one of said input rails and one of said exit rails, each of said creel rails including a pivotable input section and a pivotable exit section, each of the creel rails being connected via its pivotable input section with its associated input rail and via its pivotable exit section with its associated exit rail, trolleys movable on said rail means for carrying bobbins placed thereon, means for selectively pivoting each input section from a first position into a second position connecting the associated input rail with its creel rail for transferring trolleys carrying full bobbins from such input rail to such creel rail into a bobbin working position, means for selectively pivoting each exit section from a first position into a second position for transferring trolleys with empty bobbins from the associated creel rail to the associated exit rail, each input section and its associated exit section when assuming their respective first positions disconnecting the associated creel rail from the associated input rail and exit rail to prevent transfer of trolleys from the associated input rail to the associated creel rail and from the latter to the associated exit rail in order to maintain the trolleys on the associated creel rail in said bobbin working position, a rail arrangement operatively associated with the ring spinning machine and connecting means for operatively connecting the rail means with the rail arrangement.

15. A method of creeling bobbins into a working position at a ring spinning machine by means of a transporting rail arrangement forming a closed loop for transporting trolleys carrying full bobbins from spinning preparatory machines and trolleys carrying empty bobbins back again to the spinning preparatory machines, comprising the steps of transporting trolleys onto a rail arrangement provided above the ring spinning machine, moving the trolleys carrying full bobbins via a sloped input section of the rail arrangement above the ring spinning machine as they move onto the rail arrangement above the spinning machine and owing to the overweight of the full bobbin trolleys, the trolleys carrying the empty tubes are pushed-off the rail arrangement above the ring spinning machine onto the transporting rail arrangement, thus bringing the full bobbins into their working positions at the ring spinning machine at such rail arrangement.

3,935,822

MONORAIL TROLLEY

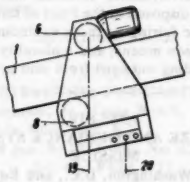
Karl Ernst Kaufmann, Wetter, Germany, assignor to Demag Aktiengesellschaft, Germany

Filed Aug. 26, 1974, Ser. No. 500,353

Claims priority, application Germany, Aug. 29, 1974, 2343502

Int. Cl.[2] B61B *3/02*

U.S. Cl. 104—93 9 Claims



1. An improved trolley structure adapted to travel on a rail having predetermined spaced upper and lower beam surfaces, comprising

a. a truck means mounting a traction wheel and a counterwheel for engaging said upper and lower rail surfaces, respectively,

b. said traction wheel and said counterwheel being spaced apart by a distance greater than the predetermined direct vertical distance between said upper and lower beam surfaces,

c. the center of gravity of said trolley being laterally displaced with respect to the point of contact between the rail and said traction wheel on the rail, whereby said counterwheel is urged against said rail by said trolley in both loaded and unloaded states,

d. motor means mounted on said truck means for driving said traction wheel,

e. said motor means being located on one side of the trolley to establish the center-of-gravity of said trolley at one side,

f. said truck means including a common frame supporting axle means for said traction wheel and said counterwheel,

g. said common frame including a central plate adapted to be disposed at one side of said rail and provided with upper journal box means for supporting bearings for said traction wheel and lower journal box means for supporting bearings for said counterwheel, and

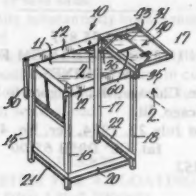
h. said lower journal box means extends longitudinally to said rail from the axis of said counterwheel and intersects the vertical axis of said traction wheel.

3,935,823

DROP LEAF TABLE

William G. England, Elmhurst, Ill., assignor to Bretford Manufacturing, Inc., Schiller Park, Ill.

Filed Aug. 29, 1974, Ser. No. 502,110
Int. Cl.² A47B 1/04
U.S. Cl. 108—80 10 Claims



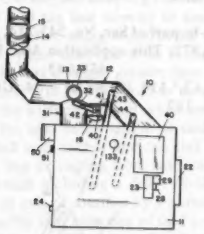
1. A drop leaf table having a table top and at least one pivotally hinged drop leaf along an edge of said table top and movable from a lowered position to a raised operative position forming an extension of said table top, a brace member pivotally mounted relative to the table top with a part thereof for bearing upwardly against the bottom surface of the drop leaf as the drop leaf moves between lowered and raised positions and engageable with a latch member on said bottom surface to hold the drop leaf in said raised position, means for urging said brace member part against said bottom surface of the drop leaf from lowered to raised positions and into engagement with said latch member, said latch member including a first inclined tab and a second tab, said first tab having a cam surface for camming said brace member part over said first tab and placing said brace member part and said first tab in locking relation when said drop leaf is in raised position, and said second tab spaced apart from said first tab for engagement with said brace member part to limit raising of the drop leaf and elevation of the brace member.

3,935,824

METHOD AND MEANS OF COMBUSTION

Robert E. Gibeault, Manor Drive, Glens Falls, N.Y. 12801

Filed Oct. 16, 1974, Ser. No. 515,232
Int. Cl.² F23G 5/12
U.S. Cl. 110—8 C 30 Claims



1. In a device for high temperature oxidation of hydrocarbons having a primary combustion chamber, a pair of spaced ports opening through the upper portion of said primary combustion chamber, a gas expansion chamber, one of said ports discharging gases from said combustion chamber into said expansion chamber, a tubular recycling chamber extending from said expansion chamber to said second port and a fan in said recycling chamber for inducing gases to return to said combustion chamber through said recycling chamber; a gas discharge stack communicating with said recycling chamber and said expansion chamber and extending from said expansion chamber oppositely from said recycling chamber, said device characterized in that a secondary combustion air intake port is provided at the juncture between said stack, recycling chamber and expansion chamber to provide a secondary combustion zone separating the gases entering said recycling chamber and those entering said stack.

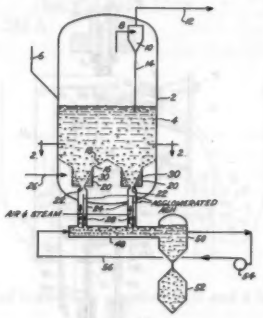
14. In a method of burning hydrocarbons while suppressisng emission of particulate materials, the steps which comprise placing a quantity of hydrocarbon material in a combustion chamber, heating said hydrocarbons and the gaseous contents of the combustion chamber to a temperature substantially above the autogenous ignition temperature thereof while discharging the heated gases from said chamber into a classification and separation chamber and therein by mechanical means inducing the particulate laden gases to separate from the lighter particulate free gases, returning the particulate laden gases to the combustion chamber and permitting the remaining gases to discharge to atmosphere through a barometric damper regulated stack, restricting the entry of atmospheric air to the combustion chamber to that which will flow into said chamber as a result of a negative pressure differential in the combustion chamber produced by the combustion process and the discharge of particulate free gases through said stack.

3,935,825

COAL ASH AGGLOMERATION DEVICE

Charles W. Matthews, Pittsburgh, Pa., and Jitendra G. Patel, Bolingbrook, Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Feb. 24, 1975, Ser. No. 552,157
Int. Cl.² F23J 1/00
U.S. Cl. 110—165 R 11 Claims



1. In an apparatus for contacting a mass of fluidized solids with a gaseous medium and withdrawing agglomerated solids from the mass of fluidized solids wherein the apparatus includes a fluidizing chamber, a grate positioned near the bottom of the fluidizing chamber to support said fluid bed and means for passing a gaseous medium through said grate to assist in maintaining the solids in a fluidized state, the improved apparatus for withdrawing agglomerated solids from said mass of fluidized solids which comprises at least one withdrawal chamber having a width less than the width of the fluidizing chamber, positioned below said fluid bed and open at the top to communicate with the fluidizing chamber and, means for introducing a high velocity fluidizing gaseous medium to the bottom portion of said withdrawal chamber, said withdrawal chamber having dimensions sufficient to contain a semi-fixed bed within said chamber, said high velocity gaseous means positioned in said withdrawal chamber to provide a high velocity inverted conical shaped gaseous flow pattern through the semi-fixed bed, the walls of said pattern provided by said semi-fixed bed.

9. A process for withdrawing agglomerated solids from the bottom of a fluidized bed of finely divided solids which comprises:

introducing a first high velocity gas stream upwardly into a vessel containing a bed of fluidizable solids through at least one withdrawal chamber, said withdrawal chamber comprising a chamber open at the top and having positioned in the bottom portion thereof an opening to receive said high velocity gas stream said chamber having dimensions sufficient to contain a semi-fixed bed within said chamber;

permitting finely divided solids to flow from the fluid bed into said chamber around the perimeter thereof;

maintaining the finely divided solids as a semi-fixed bed in said chamber, and;

adjusting the velocity of the high velocity gas stream to form an inverted cone within said chamber, the walls of said cone being the walls of the semi-fixed bed, said velocity being adjusted to permit the selective removal of agglomerated solids from said bed without removal of finely divided solids therefrom.

3,935,826
METHOD OF AND APPARATUS FOR FEEDING A WORKPIECE ALONG A SURFACE OF A SEWING MACHINE

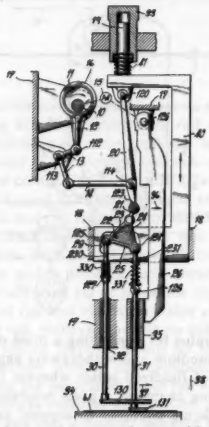
Karl Nicolay, Bielefeld, and Ernst V. D. Osten-Sacken, Brackwede, both of Germany, assignors to Durkoppwerke GmbH, Bielefeld, Germany

Filed July 2, 1974, Ser. No. 485,293

Claims priority, application Germany, July 26, 1973, 2337966

Int. Cl.² D05B *27/04*

U.S. Cl. 112—212 **11 Claims**



1. A method of operating a sewing-machine feed having a reciprocal holddown foot and a reciprocable feed foot, said method comprising the steps of:

a. pressing a workpiece web against a support surface with said holddown foot;

b. thereafter displacing said feed foot toward said workpiece at a speed first increasing to a maximum and then decreasing uniformly and continuously from said maximum until said feed foot comes to a stop against said workpiece pressing same against said surface, the uniform and continuous speed decrease bringing said feed foot to zero speed upon the pressing of said workpiece thereby;

c. thereafter displacing said holddown foot away from said workpiece;

d. thereafter sliding said feed foot and said workpiece along said surface;

e. thereafter displacing said holddown foot toward said workpiece at a speed first increasing to a maximum and then decreasing uniformly and continuously from its maximum until said holddown foot comes to a stop against said workpiece in a position pressing same against said surface, the uniform and continuous speed decrease bringing said holddown foot to zero speed upon the pressing of said workpiece thereby;

f. repeating steps (b) to (e) sequentially to incrementally advance said workpiece across said surface.

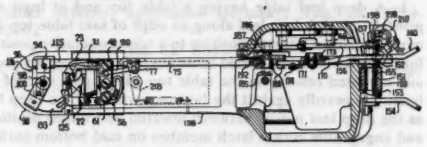
3,935,827
THREAD CUTTER MECHANISM FOR SEWING MACHINES

Frank F. Winter, Chicago, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed July 22, 1974, Ser. No. 490,783

Int. Cl.² D05B *65/00*

U.S. Cl. 112—252 **15 Claims**



1. A thread cutter mechanism for a sewing machine of the type having means for producing a needle thread loop and for supplying a bobbin thread, said thread cutter mechanism comprising a loop spreader, means mounting said loop spreader for movement into a needle thread loop having two adjacent thread portions for expanding the needle thread loop and transversely separating the thread portions thereof while at the same time positioning the bobbin thread immediately adjacent one needle thread portion, cutter knives, means mounting said cutter knives for cooperating movement, and means for actuating said cutter knives in timed relation to the movement of said loop spreader and in cooperation with one another to sever both the bobbin thread and the one needle thread portion.

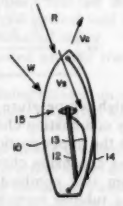
3,935,828
METHOD AND APPARATUS FOR OBTAINING MAXIMUM SAIL BOAT VELOCITY

Charles E. Pfund, 16 Balcarres Road, West Newton, Mass. 02165

Continuation-in-part of Ser. No. 243,214, April 12, 1972, Pat. No. 3,802,372. This application Apr. 8, 1974, Ser. No. 458,643

Int. Cl.² 114 *39*; B63H *9/04*; G01C *21/12*

U.S. Cl. 114—102 **1 Claim**



1. In a sailboat the method of adjusting a set of sails forming a slot comprising the steps of:

sensing the relative wind speed outside said slot;

sensing the wind speed in said slot;

differentially comparing the two sensed values of wind speed;

indicating the magnitude of the difference between said values approximately independent of incremental changes in relative wind velocity;

relatively adjusting the sails of said set for varying said slot to maximize said magnitude as an indication of maximum difference between said two sensed values of wind speed corresponding to maximum slot wind speed;

repeating the relative adjustment of said sails for successive settings of one of said sails;

indicating a quantity substantially instantaneously related to boat thrust; and

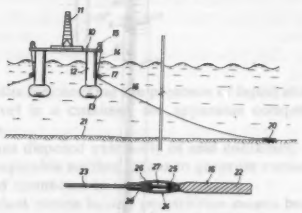
selecting the setting of said one sail which makes said quantity related to boat thrust a maximum in conjunction with said indication of maximum difference between said two sensed values of wind speed.

3,935,829

ANCHORING SYSTEM FOR A FLOATING OFFSHORE DRILLING VESSEL

Claude C. Lantz, Noisy-le-Roi, France, assignor to Forex Neptune S.A., Paris, France

Filed Nov. 19, 1973, Ser. No. 417,180
Claims priority, application France, Nov. 24, 1972, 41780
Int. Cl.² B63B *21/50*
U.S. Cl. 114—206 R **7 Claims**



1. An anchoring system for use in mooring a floating vessel of the type having an anchor line storage winch located above the surface of the water, comprising: an anchor line having a portion of its length including one end thereof wound on said storage winch, said anchor line passing from said winch toward the water bottom where the other end thereof is adapted to be secured to an anchor; a tag line wound on said winch ahead of said portion of said anchor line and having an inner end and an outer end; and coupling means for connecting said outer end of said tag line directly to said one end of said anchor line; said tag line being constructed of a material having a specific gravity less than one so as to tend to float in a body of water, and having a length greater than the depth of water in which the vessel is to be anchored so as to reach from the water bottom to the surface, so that when said portion of said anchor line and the said entire length of said tag line are wound off of said winch said anchor line can sink to the water bottom with said tag line extending from said one end to the water surface; said winch including a drum divided into two compartments along its axis of rotation by a partition substantially perpendicular to the said axis, one of said compartments receiving only said tag line and the other of said compartments receiving only said portion of said anchor line.

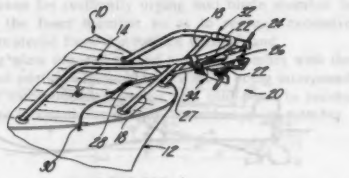
3,935,830

BOW PULPIT MOUNTED PIVOTING FLUKE TYPE ANCHOR HOLDER

Richard D. Cox, 47163 Ayers, Belleville, Mich. 48111

Filed Sept. 30, 1974, Ser. No. 510,358
Int. Cl.² B63B *21/22*
U.S. Cl. 114—210 **21 Claims**

1. In a boat having a railing mounted thereon, apparatus for mounting a pivoting fluke type anchor where the anchor includes a pair of flukes connected to a rod with each end of the rod extending beyond the flukes and including an elongated shank and means pivotally connecting the shank to the rod and flukes, said apparatus comprising: first holding means for removably supporting the anchor at one end of the rod and flukes, second holding means for removably supporting the



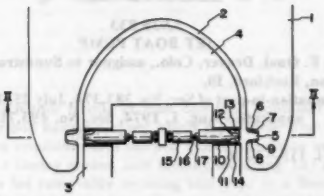
anchor at the opposite end of the rod and flukes, and securing means for securing said first and second holding means to the rail, said securing means including first and second securing means for independently securing said first and second holding means to the rail at movably selected positions relative to each other.

3,935,831

MEANS OF CONNECTING A PUSHER BOAT AND A BARGE

Takuma Yamaguchi, No. 7-5203, 2 chome, Sodegaura, Narashino, Chiba, Japan

Filed Mar. 27, 1975, Ser. No. 562,588
Claims priority, application Japan, Apr. 15, 1974, 49-42638
Int. Cl.² B63B *21/56*
U.S. Cl. 114—235 A **6 Claims**



1. A means of connecting a pusher boat and a barge comprising:

a. a notch open rearwards, formed in the stern portion of said barge and sized and shaped to receive the bow portion of said pusher boat;

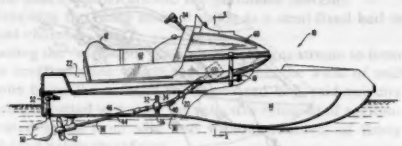
b. two vertically elongated channels formed within the wall of said notch, open toward said notch and facing each other transversely of the centerline of said barge;

c. concavities stepwise arranged from top to bottom on two side walls, opposite to each other and adjacent to said wall of said notch, of each of said channel in such a manner that any of said concavities on one of said side walls may have a corresponding concavity located at the same height on the other side wall, and horizontally elongated from the entrance to the bottom of said notch;

d. two transversely elongated connecting pins mounted on said bow portion of said pusher boat and having two convexities, shaped to correspond to and engage said concavities, on the foward and after sides of the outer end portion of each of said connecting pins;

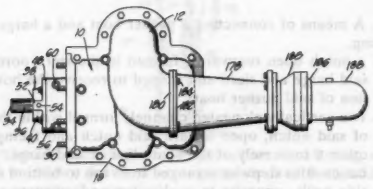
e. pressure-fluid-operated actuating means for moving said connecting pins in respective, opposite directions between retracted positions outside said channels and inserted positions in said channels respectively while said bow portion is received in said notch.

3,935,832
SELF-PROPELLED BOAT VEHICLE
Ralph D. Bawden, Billings, Mont., and Robert Olson, a/k/a John R. Olson, Price, Utah, assignors to Recreational Plastics, Inc., Billings, Mont.
Filed July 22, 1974, Ser. No. 490,714
Int. Cl.² B60F 3/00
U.S. Cl. 115—.5 A 5 Claims



1. An improvement in a water craft of the self-propelled type comprising in combination
a water-tight hull having a support surface formed in the upper surface thereof and having an opening formed in said hull,
a snowmobile having a power unit received by said support surface,
securing mechanisms for firmly securing said snowmobile to said hull,
said power unit having a power output shaft,
a propeller drive shaft extending through said opening and having a first interior end and an exterior end carrying a propeller,
sealing means disposed between said opening and said shaft, and
connecting means joining said first end of said propeller shaft to said power output shaft, said connecting means including an elongated member having a plurality of universal joints intermediate its ends.

3,935,833
JET BOAT PUMP
Hasan F. Onal, Denver, Colo., assignor to Sundstrand Corporation, Rockford, Ill.
Continuation-in-part of Ser. No. 382,374, July 25, 1973. This application Aug. 1, 1974, Ser. No. 493,715
Int. Cl.² B63H 11/00
U.S. Cl. 115—12 R 6 Claims



1. A pump for propelling a boat comprising
a pump housing having two inlet channels for receiving water and outlet passage means for discharging water;
a pump shaft rotatably mounted in said pump housing; and
a double suction impeller mounted concentrically on said pump shaft, said double suction impeller being in communication with said two inlet channels and said outlet passage means;
said two inlet channels extending from inlets below said housing to either side of said double suction impeller, the inlet to the first of said channels being defined by a first leading edge adapted to extend no lower than the bottom of the boat hull and a first trailing edge positioned behind and below said first leading edge, the inlet to the second of said channels being defined by said first trailing edge and a second trailing edge behind said first trailing edge and at a level higher than said first leading edge.

3,935,834
FROST LINE INDICATOR
Gilbert W. Buhrmann, Jr., Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 4, 1975, Ser. No. 546,952
Int. Cl.² G01D 1/00
U.S. Cl. 116—114 V 14 Claims

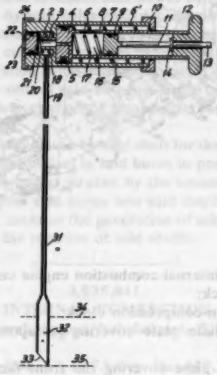
1. A frost line depth indicator for measuring the frost line depth of a material comprising:
a first hollow tube being closed at one end by an end cap inserted into said tube and open at its other end;
a second hollow tube closed at one end by a first end cap having a hole through the center thereof, closed at its other end by a second end cap, and filled with a material that exhibits one color at temperatures at and below a certain temperature and a second color at temperatures above said certain temperatures, said second hollow tube being shorter than said first hollow tube and being of such size that said second hollow tube fits inside said first hollow tube;
a rope having one of its ends threaded through said hole in said first end cap of said second hollow tube and secured to said first end cap of said second hollow tube;
means to secure said first end cap inside said one end of said second hollow tube;
means to secure said second end cap of said second hollow tube inside said other end of said second hollow tube;
a cap having a hole through the center thereof and being adapted to fit over and be secured to said open end of said first hollow tube, said rope having the other of its said ends threaded through said hole in said cap and being secured to said cap; and
a distance measuring scale formed on the surface of said second hollow tube along the length of said second hollow tube.

3,935,835

APPARATUS FOR CHECKING THE LEVEL OF LIQUID IN CONTAINERS

Hans-Joachim Rinck, Sylvaner Weg 4, 7900 Ulm (Danube), Germany

Filed Aug. 26, 1974, Ser. No. 500,404
Claims priority, application Germany, Sept. 3, 1973, 2344364
Int. Cl.² G01F 23/16
U.S. Cl. 116—118 R 22 Claims



1. Apparatus for checking the presence of liquid at a predetermined level in a cntainer, the apparatus comprising, in combination:

valve means disposed externally of said container;

manually operable suction means to generate vacuum pressure and connected to said valve means;

elongate duct means having constriction means between a first end portion extending into said container to define an opening in said duct means at said predetermined level and a second end portion connected to said valve means, said valve means being actuable by said suction means to close said duct means only on liquid being present at said level; and

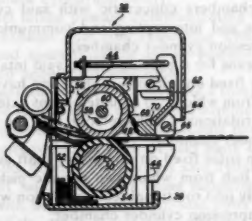
indicator means responsive to the closure of said duct means by said valve means to indicate the presence of liquid at said level.

3,935,836

METERING BLADE FOR A FUSER ROLL

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 13, 1975, Ser. No. 540,732
Int. Cl.² B05C 11/04
U.S. Cl. 118—60 10 Claims



1. An apparatus for regulating the quantity of release material metered to a heated fuser member operatively associated with a backup member wherein a sheet of support material having particles thereon passes therebetween with the particles contacting the fuser member, including:

means for applying the release material to the surface of the fuser member;

a support member;

a flexible blade member having one end portion thereof contacting the fuser member for adjusting the thickness of release material applied thereto;

biasing means for resiliently urging said blade member to contact the fuser member so as to remove excessive release material from the surface thereof; and

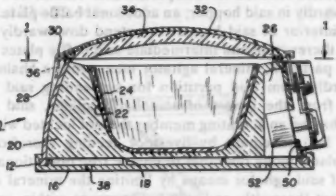
a clamping plate secured to said support member with the other end portion of said blade member being interposed between said support member and said plate to secure said plate in cantilever fashion to said support member.

3,935,837

PET FEEDER

Philip J. Mulhern, 67 Sanford Pl., Fairlawn, N.J. 07470

Filed Jan. 8, 1975, Ser. No. 539,518
Int. Cl.² A01K 5/00
U.S. Cl. 119—51.12 11 Claims



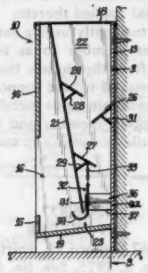
1. A pet feeder having at least one food container of selected size and having a cover which is movable from a normally open condition to a latched closed condition until released by a timing means, said feeding including: (a) a base; (b) means for removably securing said base to a floor, wall and the like; (c) a cover hingedly connected to said base; (d) biasing means for urging said hinged cover to a selected open condition above said base; (e) sealing means interposed between the cover and base so as to provide substantially a hermetic seal of the feeder when the cover is in closed condition; (f) a feeding dish carried by said base and when in seated condition in the base and said cover is in latched condition the dish contents are in sealed condition; (g) a hook pin carried by the cover and a hook member carried by the base member and at a position substantially opposite the hinge portion thereof, said hook member having one end formed with a hook and the other end pivotally carried on a pin secured to a ratchet wheel rotatably mounted on an axle carried by the base, this pin radially displaced from the axle so as to act as a crank pin as the ratchet wheel is rotated, said ratchet wheel restrained from moving in a direction to lift the hook member by the engagement of a ratchet engaging tooth carried by a pawl arm; (h) means for selectively establishing and retaining said hook member in pin retaining condition; (i) a timer and a cam means operatively associated with said timer, this cam means at the conclusion of the timer cycle moving the pawl member to disengage the hook member from the pin to release the cover which is then opened by the bias means, and (j) means for releasing the latched cover for inspection of the contents of the dish at a period in time which is prior to the original time set on the timer.

3,935,838

LIVESTOCK MINERAL DISPENSER

Eldon E. Johnson, R.R. No. 1, Box 247, Nokomis, Ill. 62075

Filed Dec. 10, 1973, Ser. No. 423,391
Int. Cl.[2] A01K 5/00
U.S. Cl. 119—54 2 Claims



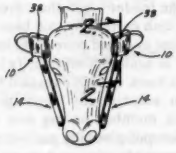
1. A livestock mineral dispenser comprising: a downwardly and rearwardly sloping partition for bounding a hopper for mineral storage; plural spatially separated and overlapping baffle plates secured to said partition to extend downwardly and inwardly in said hopper; an additional baffle plate secured to the interior of said hopper to extend downwardly and inwardly therewithin and intermediate said baffle plates secured to said partition; mineral agitator means and a chain spaced rearwardly from said partition for suspending said agitator means from the lowest of said baffle plates, said agitator means having an actuating member thereof located within said trough for movement by livestock feeding therefrom, said baffle plates being operable to enable free operational movement of said agitator means by limiting the mineral quantity in contact therewith; and side baffle means within, and laterally and downwardly converging toward the center of said hopper for limiting mineral flow into said trough; whereby mineral flow from said hopper into said trough is determined in accordance with movement of said agitator means.

3,935,839

FACE FLY DEVICE

Roy Goodwin, Rte. 2, Lancaster, Mo. 63548

Filed May 23, 1974, Ser. No. 472,619
Int. Cl.[2] A01K 29/00
U.S. Cl. 119—156 9 Claims



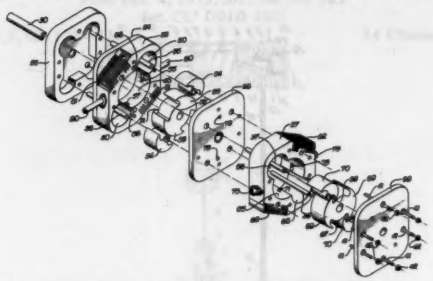
1. A face fly device comprising,
a flexible container means having upper and lower ends,
said container means having a compartment area provided therein for receiving a face fly repellant liquid therein,
means on the upper end of said container means for securing said container means to the ear of an animal,
and a wick means having upper and lower ends, said upper end of said wick means being in communication with the liquid in said compartment area, said wick means extending downwardly from said container means so that said wick means will be positioned adjacent the animal's face.

3,935,840

ROTARY ENGINE

John H. Fisher, 1422 Waterman Ave., San Bernardino, Calif. 40921

Filed Aug. 7, 1974, Ser. No. 495,410
Int. Cl.[2] F02B 53/08
U.S. Cl. 123—8.23 3 Claims



1. A rotary internal combustion engine comprising:
a power block;
a fuel-suction-compression block;
an intermediate plate covering juxtaposed faces of said blocks;
a front end plate covering the front face of said power block;
a rear end plate covering the rear face of said compression block;
a power shaft normal to and extending centrally through said plates and blocks;
four valve shafts parallel with and equally spaced from said power shaft and including two power valve shafts lying in a common plane with said power shaft and two compression valve shafts lying in a different common plane with said power shaft, said common planes being symmetric with a vertical plane containing the axis of said power shaft;
bearing means provided in said plates in which said shafts journal,
there being a power cylinder chamber formed in said power block and a compression cylinder chamber formed in said compression block, both chambers being co-axial with said power shaft,
there being exhaust ports at diametrically opposite points in the wall of said power cylinder chamber;
there being fuel inlet ports at diametrically opposite points in the wall of said compression cylinder chamber,
there being formed in said power block two cylindrical valve chambers concentric respectively with said power valve shafts and intercepting and communicating with said power cylinder chamber,
there being formed in said compression block two cylindrical valve chambers concentric with said compression valve shafts and intercepting and communicating with said compression cylinder chamber;
carburetor means for supplying fuel to said intake ports;
a power rotor fixed on said power shaft and having a cylindrical hub from which two arcuate pistons extend diametrically into rotational sealing relation with the wall of said power cylinder chamber;
a compression rotor fixed on said power shaft and having a cylindrical hub from which two arcuate pistons extend diametrically into rotational sealing relation with the wall of said compression cylinder chamber;
four segmental valves one of which is fixed on each of said valve shafts to make a peripheral sliding sealing contact with said cylindrical valve chambers and with the hubs of said power rotor and compressor rotor respectively;

a gear train mounted on said shafts whereby said power shaft drives said valve shafts at a 2 to 1 ratio, with said valves cooperating with said pistons to form duplicate fuel suction and compression zones in said compression chamber on opposite sides of said compression rotor and duplicate expansion and exhaust zones in said power chamber on opposite sides of said power rotor;

there being two fuel charge firing bores provided in said power block close to and communicating with diametrically opposed points in said power cylinder chamber which are close to where said power cylinder chamber is intercepted by said valve cylinder chamber;

there being passage means formed in said intermediate plate and in said compressor block leading from each of said fuel compression zones on opposite sides of said compressor rotor to one of said two fuel firing bores to simultaneously deliver charges of compressed fuel to said bores; and

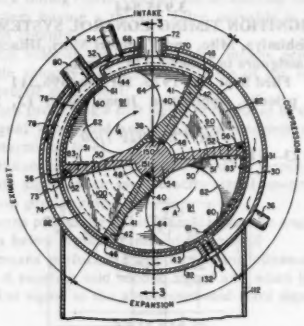
an ignition system driven by said shaft for the timely ignition of said charges of fuel in said bores to produce duplicate simultaneous power strokes by the emission of combustion gases from said bores into said duplicate expansion and exhaust zones as the generation of said zones is being initiated by the rotation of said shafts.

3,935,841

ROTARY INTERNAL COMBUSTION ENGINE

Antoon B. Longeval, August Nobelsstraat, 3, 2700 Sint-Niklaas, Belgium

Filed Nov. 27, 1973, Ser. No. 419,247
Int. Cl.² F02B 55/14
U.S. Cl. 123—8.47 **15 Claims**



6. A rotary internal combustion engine having an operating cycle including the four phases of intake, compression, expansion and exhaust comprising

a. a stator member having:

1. a hollow cylindrical cavity;
2. a fuel intake passage communicating with the cavity;
3. an exhaust port communicating with the cavity and spaced apart from the intake passage by a predetermined angular distance; and
4. an ignition means for delivering a spark into the cavity of the stator member at a predetermined point between the intake passage and the exhaust port;

b. two pairs of blades each of said pairs being in a plane extending diametrically across said cylindrical cavity;

c. each of said blade pairs being supported by a rotating shaft with the plane of one of said pairs intersecting the plane of the other of said pairs whereby the space within said cavity is divided into four spaces with two diametrically opposite spaces of said four spaces being combustion chambers in part defined by said blades; one of said shafts being the power output shaft of said engine;

d. a universal joint unit, including a second pair of shafts;

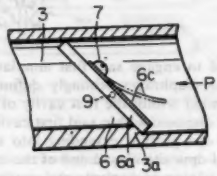
e. means, including the angle between the axis of the shafts of said second pair of shafts being other than 180°, for interrelating the angular velocity of said two pairs of blades such that the angular velocity of one of said pairs of blades remains substantially constant throughout rotation while the angular velocity of the other of said pairs of blades alternately increases and decreases throughout rotation whereby during operation the volume of said combustion chambers increases and decreases in size to provide for each of said combustion chambers the four sequential phases of intake, compression, expansion and exhaust, said ignition means being disposed at a point of said stator such that the spark thereof communicates with said combustion chambers in sequence at substantially a point at which the first pair of blades reach their closest proximity to the second pair of blades.

3,935,842

SUCTION SYSTEM OF INTERNAL COMBUSTION ENGINE

Toshitugu Ishizawa, Higashi-murayama; Motokazu Akahori, and Hideki Sato, both of Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 22, 1974, Ser. No. 463,182
Claims priority, application Japan, Apr. 23, 1973, 48-45992
Int. Cl.² F02B 77/00
U.S. Cl. 123—52 MF **6 Claims**



1. A suction system of an internal combustion engine, comprising a suction pipe for suction air flow to the engine; a throttle valve provided in the suction pipe; a suction port downstream the throttle valve and adjacent the engine; a reed valve provided in said suction pipe in the vicinity of said suction port for preventing exhaust gas backflow from the engine to the suction pipe, said reed valve having a valve seat with a valve opening therein, a support pin pivotally supporting said valve, and a reed fixed on said valve seat to open the valve opening of said valve seat in dependence on vacuum downstream of the valve and to close the valve opening in dependence on pressure downstream of the valve, and control means for opening communication through said suction pipe by rotating said valve to a position of reduced resistance to flow therethrough when the engine load exceeds a predetermined value.

3,935,843

NONLINEAR VACUUM SPARK ADVANCE SYSTEM

George Ludwig, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 2, 1973, Ser. No. 329,289
Int. Cl.² F02P 5/04
U.S. Cl. 123—117 A **5 Claims**

1. A vacuum control valve assembly for regulating the vacuum servo mechanism of an internal combustion engine distributor comprising:

a housing having a first annular cavity with one open end and an opposite closed end, said housing further having a second annular cavity with an open end and an opposite closed end adjacent said first cavity opposite closed end,

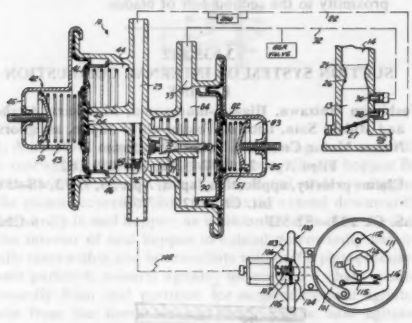
said first and second cavities having at least one port for fluid communication into or out of said cavities;

a central passage interposed between the closed end of said first cavity and the closed end of said second cavity, said central passage having an inlet adapted to receive a first vacuum source signal and an outlet adapted to provide an outlet signal to said vacuum servo of the distributor;

a first cover member mounted to the open end of said first cavity,

a first annular cup shaped member mounted within said first cavity of the housing, between said first cover member and said opposite closed end of the first cavity;

a first annular diaphragm having an outside diameter portion interposed between said first cover member and said open end of said first cavity and an inside diameter portion adapted to engage said first annular member, said first annular diaphragm sealingly defining a first and second chamber within the first cavity of the housing;



a first conduit disposed within said first cavity, said conduit having one end portion extending into said first cavity through said opposite closed end of the cavity, said conduit further having an opposite end portion integral with said opposite closed end of the first cavity, and a first passage providing communication between said central passage and said first chamber of the first cavity, said one end portion of said first conduit having a valve seat;

a check valve disposed within said central passage between said first passage of the first conduit and said central passage outlet, said check valve adapted to permit fluid communication through said central passage only when said first vacuum source signal is below a predetermined level;

first means for biasing said first diaphragm, said first biasing means including:

first means for providing and regulating communication between said second chamber of the first cavity and the atmosphere; and

means for limiting fluid communication from said central passage to said first chamber of the first cavity when said first vacuum source signal is above a predetermined level;

a second cover member mounted to the open end of said second cavity;

a second annular cup shaped member mounted within the second cavity of said housing, between said second cover member and said opposite closed end of said second cavity;

a second annular diaphragm having an outside diameter portion interposed between said second cover member and said open end of said second cavity and an inside diameter portion adapted to engage said second annular member, said second annular diaphragm sealingly defining a first and second chamber within said second cavity of the housing;

means for sealing said first cover member to said open end of the first cavity and said second cover member to said open end of the second cavity of the housing;

a second conduit disposed within said second cavity, said conduit having one end portion extending into said first cavity through said opposite closed end of the second cavity, said second conduit further having an opposite end portion integral with the opposite closed end of said second cavity, a second passage providing fluid communication from said first chamber of the second cavity to said central passage outlet and means for terminating the fluid communication from said first chamber of the second cavity of said central passage outlet;

a third conduit having one end portion extending out of said second cavity and an opposite end portion integral with said second cavity, said conduit having a third passage for providing communication from a second signal source to said first chamber of the second cavity of the housing;

second means for biasing said second diaphragm, said second biasing means including:

second means for providing and regulating communication between said second chamber of said second cavity and the atmosphere; and

means for controlling fluid communication from said first chamber of the second cavity to said central passage outlet when the signal source of said second vacuum source signal in the first chamber of the second cavity is above said predetermined level;

an outlet port integral with the opposite closed end of said first cavity of the housing, said outlet port having a passage adapted to provide fluid communication from the first chamber of said first cavity to said central passage outlet.

3,935,844

IGNITION TIMING CONTROL SYSTEM

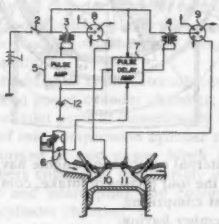
Torazo Nishimiya, Mito, and Yasunori Mori, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 11, 1973, Ser. No. 396,311

Claims priority, application Japan, Sept. 13, 1972, 47-91225

Int. Cl.² F02P *1/00*

U.S. Cl. 123—117 R **8 Claims**



1. An ignition timing control system for a reciprocating internal combustion engine having a first spark plug and a second spark plug in each combustion chamber comprising:

a throttle valve for controlling the amount of air-fuel mixture supplied to the engine;

a breaker for generating a trigger signal;

a pulse amplifier generating a first pulse signal for actuating the first spark plug in response to the trigger signal from said breaker; and

a pulse delay amplifier having

a. a first pulse generator for generating a second pulse signal in response to the trigger signal from said breaker, said second pulse signal having a pulse width which is continuously variable substantially in inverse proportion to the amount of opening of the throttle valve, and

b. a second pulse generator generating a third pulse signal for actuating the second spark plug in response to the trailing end of the second pulse signal, the initiation of the third pulse signal being delayed from the first pulse signal by the time interval corresponding to the width of the second pulse signal, so that the interval of time between operations of said first and second spark plugs is varied with the variation of the amount of opening of the throttle valve.

3,935,845

IGNITION TIMING CONTROL DEVICE FOR AUTOMOTIVE IGNITION SYSTEM

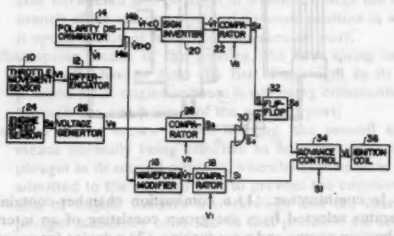
Shigeo Aono, Sekimachi, and Norio Mizuguchi, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama and Hicachi, Ltd., Tokyo, both of, Japan

Filed June 28, 1974, Ser. No. 484,240

Claims priority, application Japan, June 30, 1973, 48-73336

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **9 Claims**



1. A spark timing control device for an internal combustion engine system having a throttle valve movable in its intake port, which comprise:

a throttle velocity signal generating means generating a throttle velocity signal representative of the velocity of the throttle movement;

first means producing a first signal in response to said velocity signal when said velocity signal exceeds a positive predetermined level;

second means producing a second signal in response to said velocity signal when said velocity signal lowers below a negative predetermined level;

third means producing a third signal when the engine speed lowers below a predetermined value; and

fourth means performing ignition timing advance control when it receives said second signal and when it receives said first signal in the absence of said third signal.

3,935,846

INSTALLATION FOR THE DIGITAL-ELECTRONIC CONTROL OF INLET, EXHAUSTION AND INJECTION VALVES AS WELL AS OF THE INJECTION IN INTERNAL COMBUSTION ENGINES

Hermann Zelenka, Bernhausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

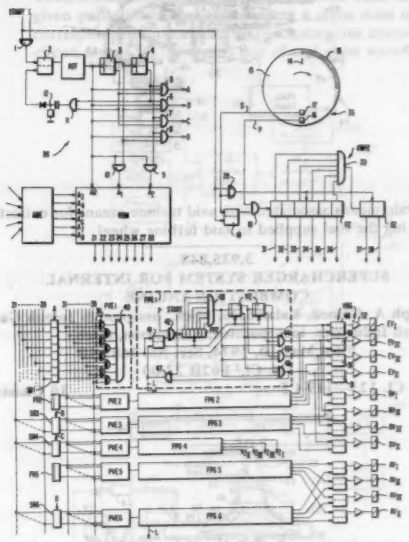
Filed Sept. 3, 1974, Ser. No. 502,905

Claims priority, application Germany, Aug. 31, 1973, 2343905

Int. Cl.² F02P *3/02*

U.S. Cl. 123—117 R **32 Claims**

1. A control installation for the digital-electronic control of at least one of valve means and ignition means in internal combustion engines, in which the valve means are electromagnetically actuated and the respective crankshaft position is adapted to be determined digitally, characterized in that it comprises control circuit means including a fixed value storage means in which at least for one cylinder of the engine, at least one of opening and closing points of time of the valve means, on the one hand, and ignition points of time, on the other, are operable to be at least partially stored and selected as digital values coordinated to the respective operating conditions and corresponding to a predetermined crankshaft position in the form of data sets, storage register means for each stored value of a data set operatively connected to the fixed value storage means; the stored value being transferable to the storage register means, pulse comparison means for each value of a data set operatively connected to the storage register means, in which a value is adapted to be compared



with the respective crankshaft position and which is operable to produce a commencing pulse in case of agreement of the two values, and a follower pulse generator means at least for each value of a data set operatively connected with the respective comparison means in which, beginning and together with the commencing pulse, a number of pulses corresponding to the number of cylinders is produced, uniformly distributed over a predetermined number of degrees of the crankshaft, and means for feeding the last-mentioned pulses to at least one of valve actuating means and ignition means of the associated cylinder in a sequence corresponding to the ignition sequence.

3,935,847

COMBINED SUPERCHARGER AND CARBURETION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Incorporated, Kalamazoo, Mich.

Filed Mar. 22, 1974, Ser. No. 453,680

Int. Cl.² F16D *31/00*

U.S. Cl. 123—119 CF **10 Claims**

1. In a supercharger system for an internal combustion engine, comprising:

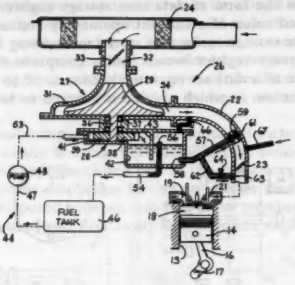
rotatable centrifugal compressor means having an inlet port for receiving a compressible gas and an outlet port for discharge of said gas;

rotatable turbine means connected to said compressor means for rotatably driving same, said turbine means including a rotatable turbine wheel;

tank means for containing therein a supply of a substantially incompressible combustible fuel;

conduit means defining therein a passage providing communication between said tank means and said turbine means, said passage having nozzle means associated with the discharge end thereof for directly said fuel against said turbine wheel to rotatably drive same;

means for pressurizing the fuel and for supplying same to said nozzle means; and

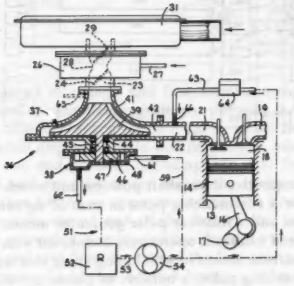


drain means associated with said turbine means for collecting the fuel supplied to said turbine wheel.

3,935,848
SUPERCHARGER SYSTEM FOR INTERNAL COMBUSTION ENGINE

Joseph A. Gamell, Kalamazoo, Mich., assignor to Joseph Gamell Industries, Incorporated, Kalamazoo, Mich.

Filed May 10, 1974, Ser. No. 468,810
Int. Cl.² F02D 23/00
U.S. Cl. 123—119 CF 10 Claims



1. In combination with an internal combustion engine, a supercharger system comprising:

rotatable centrifugal compressor means having an inlet port for receiving a compressible gas and an outlet port for discharge of compressible gas to the engine, said compressor means including a rotatable compressor wheel;

rotatable turbine means connected to said compressor means for rotatably driving same, said turbine means including a rotatable turbine wheel;

a fluid system for driving said turbine wheel, said fluid system containing therein an incompressible working fluid which is continuously maintained in a liquid state, said fluid system also including,

tank means containing therein a supply of said working fluid,

conduit means defining a passage providing communication between said tank means and said turbine means, said passage having nozzle means associated with the discharge end thereof for directing said working fluid while in a liquid state against said turbine wheel to rotatably drive same,

pump means driven by said engine for pressurizing the working fluid and for supplying same to said nozzle means, and

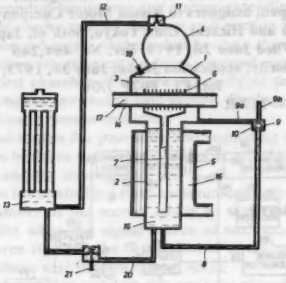
drain means associated with said turbine means for collecting the liquid working fluid supplied to said turbine wheel;

said fluid system being independent of the exhaust gases discharged from said engine whereby said turbine is driven solely by said liquid working fluid.

3,935,849
FUEL VAPORIZING DEVICE FOR AN INTERNAL COMBUSTION ENGINE OR GAS TURBINE

Walter D. Mills, Mold, Wales, assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 3, 1974, Ser. No. 502,263
Claims priority, application United Kingdom, Sept. 11, 1973, 42636/73
Int. Cl.² F02M 31/00
U.S. Cl. 123—122 AA 10 Claims

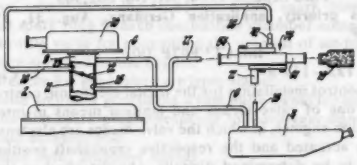


1. In combination: (1) a combustion chamber-containing apparatus selected from the group consisting of an internal combustion engine and a gas turbine, (2) a device for vaporizing liquid fuel prior to its introduction into the combustion chamber of said apparatus, which device comprises a heat pipe vessel containing a heat transfer fluid, said heat pipe having a heat recovering zone and a heat discharging zone, said heat recovering zone which contains said fluid in liquid phase is operationally engaged with the exhaust system of said apparatus, to collect heat from said exhaust system;.said heat discharging zone which contains said fluid in a vapor phase is in communication with said heat receiving zone is operationally engaged with the fuel inlet system of said apparatus to condense the vapor phase of the fluid to transfer heat to the fuel to be evaporated; (3) vapor removal means operationally engaged with said heat discharge zone to remove excess of the vapor phase from said heat pipe; and (4) fluid supply means communicating with a reservoir of said heat transfer fluid operationally engaged with said heat receiving zone to supply make-up heat transfer fluid in the liquid phase to said heat receiving zone.

3,935,850
VAPOR REGULATING VALVE

Jack B. King, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 12, 1974, Ser. No. 478,460
Int. Cl.² F02M 59/00; F16K 15/00
U.S. Cl. 123—136 2 Claims



1. A valve assembly for regulating the flow of fuel vapor and air in a fuel vapor recovery system for a combustion engine including an intake manifold and a fuel reservoir, the valve assembly comprising, in combination:

a valve housing having a fuel vapor inlet with two branches open to the fuel reservoir for admitting fuel vapor therefrom, an air inlet open to the atmosphere for admitting air therefrom, an outlet open to the intake manifold for delivering a controlled mixture of fuel vapor and air thereto, a vacuum port with two branches open through an orifice to the intake manifold for communicating intake vacuum therefrom;

a first diaphragm in the housing, the first diaphragm defining a first chamber open only to one branch of the vacuum port, the first diaphragm being exposed outside the first chamber to the atmosphere and being movable between a first position in which it blocks the outlet and one branch of the fuel vapor inlet and a second position in which it opens the outlet and one branch of the fuel vapor inlet, whereby air from the air inlet and fuel from the fuel vapor inlet are allowed to flow to the outlet;

a second diaphragm in the housing, the second diaphragm defining a second chamber open only to the other branch of the fuel vapor inlet, the second diaphragm being movable between a first position in which it blocks the other branch of the vacuum port and a second position in which it opens the other branch of the vacuum port;

first spring means in the housing, the first spring means being effective to hold the first diaphragm in its first position when engine vacuum is not being communicated through the one branch of the vacuum port;

second spring means in the housing, the second spring means normally being effective to hold the second diaphragm in its second position, whereby atmospheric air is admitted to the vacuum port to prevent the communication of engine vacuum therethrough and the first diaphragm is thereby biased to its first position, the second diaphragm being movable to its first position against the second spring means by a critical fuel vapor gauge pressure, whereupon the position of the first diaphragm is made responsive to the communication of engine vacuum through the vacuum port.

3,935,851

FUEL METERING SYSTEM FOR SPARK IGNITION ENGINES

William Paul Wright; Leroy Shafer; John Ondocsin, all of Huntsville, Ala., and Ivor W. Carter, Grosse Pointe Woods, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 26, 1973, Ser. No. 428,261

Int. Cl.² F02M *39/00*; G05D *11/00*; F02C *9/04*

U.S. Cl. 123—139 E **15 Claims**

1. A fuel metering system for maintaining a predetermined fuel-air mass ratio for an engine comprising:

a. means for generating an air signal having a magnitude representative of the mass flow of air into the engine at a set of given values for a set of ambient parameters;

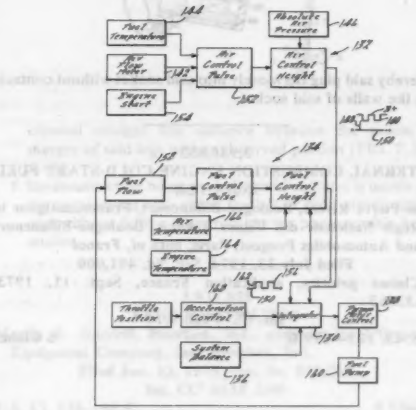
b. fuel pumping means for pumping fuel in accordance with a control signal applied thereto;

c. mixing means for mixing fuel pumped by said fuel pumping means with the air entering the engine;

d. a fuel flow transducer circuit means comprising a fluid flow transducer means disposed in fluid circuit between said fuel pumping means and said mixing means to measure fuel pumped by said fuel pumping means to said mixing means and an output circuit means operatively associated with said fluid flow transducer means to provide a fuel signal having a magnitude representative of the mass flow of fuel pumped by said fuel pumping means to said mixing means at said set of given values for said set of ambient parameters;

e. and control circuit means for providing said control signal, said control circuit means including means for providing a reference fuel-air ratio signal representative of said predetermined fuel-air mass ratio, means for relatively ratioing said fuel signal and said air signal with respect to each other to provide an actual fuel-air mass ratio signal, and means for establishing said control signal in accordance with said actual and said reference fuel-air mass ratio signals such that said fuel pumping means delivers the correct mass fuel flow to said mixing means for securing substantial correspondence between said actual and said reference fuel-air mass ratio signals;

f. wherein both said air signal and said fuel signal are pulse waveforms composed of repetitive pulses each having given pulse dimensions representing a given mass of the corresponding fluid and further including one correction circuit means for correcting one of said pulse waveforms



in response to change in one of said ambient parameters of said set of ambient parameters from its given valve and another correction circuit means for correcting the other pulse waveform in response to change in another ambient parameter of said set of ambient parameters from its given value; and

g. wherein said one correction circuit means is responsive to a change in an ambient parameter which changes the mass flow of the fluid whose mass flow is represented by said other waveform and said another correction circuit means is responsive to a change in an ambient parameter which changes the mass flow of the fluid whose mass flow is represented by said one waveform.

3,935,852

SPARK PLUG CONNECTOR AND IGNITION COIL MODULE FOR ENGINE IGNITION SYSTEM

John J. Donovan, West Springfield, and Daniel R. Isham, Hampden, both of Mass., assignors to R. E. Phelon Company, Inc., East Longmeadow, Mass.

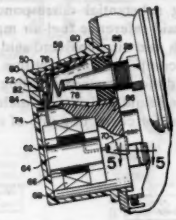
Filed May 20, 1974, Ser. No. 471,806

Int. Cl.² F02P *11/00*

U.S. Cl. 123—148 A **11 Claims**

1. In a device having a self-contained internal combustion engine, the combination comprising: an internal combustion engine having a spark plug an outer end portion of which extends outwardly from the remainder of said engine, a stationary structure other than said engine or spark plug spaced outwardly from said engine in the vicinity of said spark plug, a unitary ignition module, said module having a socket receiving said outer end portion of said plug and said module also including an ignition coil, with a primary winding and a secondary winding, for supplying high-tension voltage to said spark plug, and means removably fixing said module to said stationary structure whereby said module is structurally unsupported by said plug, said socket at all points along the

length of said outer end portion of said plug having a transverse cross section substantially larger than that of said plug



whereby said plug fits loosely into said socket without contacting the walls of said socket.

3,935,853

INTERNAL COMBUSTION ENGINE COLD-START FUEL INJECTOR

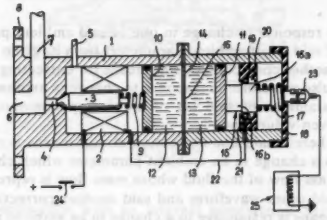
Jean-Pierre Rivere, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed July 23, 1974, Ser. No. 491,000

Claims priority, application France, Sept. 11, 1973, 73.32663

Int. Cl.² F22b 7/14

U.S. Cl. 123—179 G 6 Claims



1. In combination with an internal combustion engine having a fuel flow passage and an electrical control circuit for a starter motor, said circuit being connected to an associated source of electrical power and including a manual control switch, a cold-start fuel injector comprising: a housing; a normally closed needle valve associated with the fuel flow passage for controlling the delivery of fuel to said engine; a solenoid on said housing for actuating said needle valve in an opening direction inserted in electrical series with the manual control switch in said control circuit; a fluid-type damping means having a pair of movable end walls defining a chamber and having a fluid in said chamber and a partition located in said chamber and fixed to said housing, said partition having therein a throttling orifice; a spring interposed between one of said pair of movable end walls and said needle valve to bias said needle valve in a closing position; normally closed contact means associated with the other of said movable end walls and inserted in electrical series with said solenoid in said control circuit, said normally closed contact means including a movable member for opening and closing said contact means, said movable member being mounted on the other one of said movable end walls for movement therewith, said normally closed contact means being biased in an opening direction via said fluid-type damping means when said needle valve is actuated in said opening direction.

3,935,854

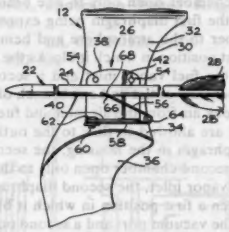
ARCHERY BOW AND ARROW SUPPORT

Fernando Troncosco, Jr., 1851 S. Orange Ave., Monterey Park, Calif. 91754

Filed Dec. 4, 1974, Ser. No. 529,444

Int. Cl.² F41B 5/00

U.S. Cl. 124—24 R 11 Claims



1. Improved Archery Equipment comprising, in combination:

a. an archery bow having a bow handle including a sidewall and a bottom shelf defining an arrow-receiving space; and,

b. an improved reversible arrow rest attached to said bow handle in said arrow-receiving space, said rest comprising, in combination:

i. a base support in said space attached to said bow handle; and,

ii. at least one resilient, vertically depressible, elongated, free-standing, upwardly projecting arm rising above said base support in said arrow-receiving space, spaced laterally from and above said bow handle to provide free arrow shaft and vane clearance therefrom and secured adjacent the lower end thereof to said base support, said at least one projecting arm extending generally along the forward-rearward axis of said bow, a portion of said at least one projecting arm providing a fork adjacent the upper end thereof for a shaft of an arrow, said fork being dimensioned and positioned with respect to the bow so as to permit all vanes of an arrow, during shooting of an arrow from said bow, to freely clear without striking any part of said at least one projecting arm, including said fork.

3,935,855

AIR HEATER, ESPECIALLY FOR CONNECTION TO A CENTRAL HEATING SYSTEM

Cors van Vliet, Zwolle, Netherlands, assignor to N.V. Werktuigenfabrieke Mulder, Netherlands

Continuation-in-part of Ser. No. 256,077, May 23, 1972, Pat. No. 3,820,526. This application Apr. 24, 1974, Ser. No. 463,588

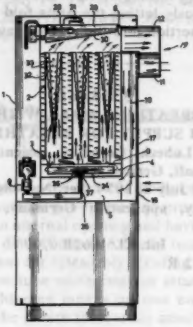
Claims priority, application Netherlands, May 24, 1971, 7107090

Int. Cl.² F24H 3/02

U.S. Cl. 126—110 R 1 Claim

1. Air heater comprising a heat exchanger compartment, in which are arranged a series of parallel rows of vertical heat exchange tubes, the lower ends of which are connected to a joint burner compartment and the upper ends of which are connnected to a joint flue compartment whereas two opposite lateral sides of the heat exchanger compartment are connected to air supply and discharge compartments respectively for feeding the air to be heated transversely through said heat exchanger compartment, said rows of heat exchange tubes fixed by a first, a second and a third burner respectively, each burner comprising a casing having a series of outlet apertures in its upper wall, said outlet apertures being partially closed by a series of suspended corrugated strips in conical configuration alternating with straight strips defining the conical configuration, all of the outlet apertures of a burner being mutually

connected by a narrow slot partially closed in the same way as the outlet apertures themselves, said burner casings enclosing an open ended horizontal tube in which are centrally mounted



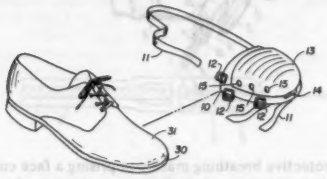
two oppositely directed gas nozzles, and multistage thermostat means controlling the individual burners by successive stages set at staggered temperatures.

3,935,856

SHOE AND FOOT WARMER

Wayne M. Loftin, Pasadena, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y.; a part interest.

Filed Jan. 14, 1975, Ser. No. 540,991
Int. Cl.² A61F 7/06
U.S. Cl. 126—208 **3 Claims**



1. A device for warming a shoe to which it is externally mounted comprising

a. a base unit of a size to fit about the toe cap of a shoe with means to attach the base unit to a shoe,

a cover hinged to the top section of the base cap, enclosing a heater section fitted in the base unit below the hinged cover.

3,935,857

CARDIAC CATHETER

Eddy D. Co, 3032 W. Iona Terrace, Milwaukee, Wis. 53221

Filed July 31, 1974, Ser. No. 493,389
Int. Cl.² A61M 25/00
U.S. Cl. 128—2.05 **5 Claims**

1. A catheter for insertion through the aorta and into tip engagement with a coronary artery ostium of a human heart, said catheter comprising:

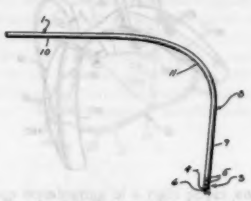
a. a preformed tubular body of relatively high torque flexible plastic and of substantially constant thickness throughout,

b. said body having straight inner and outer legs joined by a continuously curved central portion and with said outer leg forming the tip of the catheter,

c. said continuously curved central portion being of substantially infinite radius at its points of merger with said legs and gradually decreasing in radius inwardly from said points toward its central point,

d. said legs being disposed at an angle of substantially 85° to each other,

e. the straight line distance from said curved portion's midpoint to the intersection of the imaginary inward extensions of said legs (FIG. 7, line D-E) being about ¼ the



chordal straight line distance between the points of merger of said legs with said curved portion (FIG. 7, line A–B),

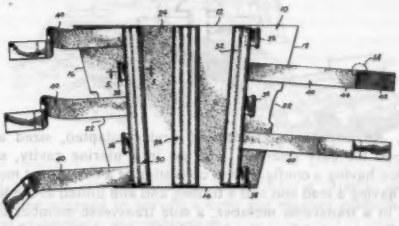
f. the construction being such that said catheter is usable for tip engagement with either the left or right artery ostium and without falling therefrom during photographic heart studies.

3,935,858

KNEE IMMOBILIZER

Marlin R. Harroff, Bourbon, Ind., assignor to Orthopedic Equipment Company, Inc., Bourbon, Ind.

Filed Jan. 13, 1975, Ser. No. 540,505
Int. Cl.² A61F 3/00
U.S. Cl. 128—80 C **5 Claims**

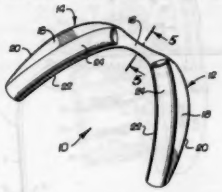


1. An immobilizer for the knee of a patient comprising a flexible cover means having in planar orientation upper and lower edges and opposite side edges, a first rigidifying means connected to said cover means between said side edges and extending from adjacent the upper edge to adjacent the lower edge of the cover means, said first rigidifying means for positioning behind the knee when said cover means is applied to the patient, second and third rigidifying means, each second and third rigidifying means including means for detachable and adjustable securement to said cover means, and means for securing said cover means about said knee, said second rigidifying means being adjustably secured to said cover means between said first rigidifying means and one cover means side edge for positioning at the inside of said knee when said cover means is applied to the patient, said third rigidifying means being adjustably secured to said cover means between said first rigidifying means and the other cover means side edge for positioning at the outside of said knee when the cover means is applied to the patient, said securing means for the cover means being carried by said second and third rigidifying means.

3,935,859
SURGICAL NASAL SPLINT

Donald E. Doyle, 8147 Amor Road, Los Angeles, Calif. 90046

Filed Sept. 16, 1974, Ser. No. 506,401
Int. Cl.² A61F 5/04
U.S. Cl. 128—89 R 7 Claims



1. A surgical nasal septum splint made of one piece of flexible material, and characterized by two splint limbs having anterior ends joined together by an isthmus adapted to underlie the columella of the patient to provide an anchor to preclude accidental aspiration, and having free posterior ends for conjoint nasal insertion, each of the limbs having a flat inside surface to fit against the nasal septum.

3,935,860
INTRAUTERINE DEVICE WITH RESTRICTOR FOR MAINTAINING DEVICE IN UTERINE CAVITY

Seymour Hoff, San Jose, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Aug. 21, 1974, Ser. No. 499,185
Int. Cl.² A61F 5/46
U.S. Cl. 128—130 7 Claims

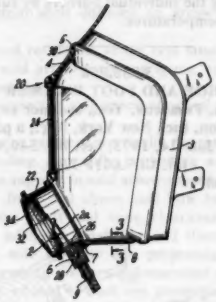
1. An improved intrauterine device adapted, sized and shaped for easy insertion and use in a uterine cavity, said device having a configuration consisting of a dependent member having a lead end and a trailing end and united at the lead end to a transverse member, a sole transverse member outwardly projected from the dependent member, a left and right arm formed by the transverse member where it unites with the dependent member, the arms having an upper surface the lead end and a lower surface facing the trailing end and terminated in distant rounded ends, the improvement consisting of a restraining member at the lead end with the member raised above the surface of the transverse member to form a space between the restraining member and the transverse member, said restraining member extended towards the ends of the transverse member for preventing the arms from folding up and away from the dependent member, thereby substantially maintaining the shaped configuration of the device for a prolonged period of time when the device is placed in a viable uterine cavity.

7. An improved intrauterine device adapted, sized and shaped for easy insertion, and use in an intrauterine cavity, said device having a configuration consisting of a dependent member having a lead end and a trailing end and united at its lead end to a transverse member, a single transverse member outwardly projected from the dependent member and consisting of left and right arms having an upper surface facing the lead end and a lower surface facing the trailing end with the arms formed where the transverse member is united to the dependent member, the improvement consisting of unidirectional means on the lower surface of the left and right arms where said arms extend from the dependent member for unidirectional downward folding of the arms to substantially prevent the arms from folding up from the independent member while simultaneously letting the arms fold downward to increase ease of insertion into the uterine cavity.

3,935,861
PROTECTIVE BREATHING MASK WITH COMPRESSED AIR SUPPLY FOR BREATHING

Ernst Warncke, Lubeck, Germany, assignor to Drägerwerk Aktiengesellschaft, Germany

Filed July 1, 1974, Ser. No. 484,880
Claims priority, application Germany, July 14, 1973, 2336047
Int. Cl.² A62B 7/00
U.S. Cl. 128—142 R 5 Claims



1. A protective breathing mask comprising a face encircling mask body, a compressed gas line connected into the interior of said mask body, said mask body having an encircling rim portion defining an air seal cavity, a tubular conduit defined in a wall of said mask and forming a partial flow gas passage extending from said gas line to said cavity, and throttle means in said partial gas passage for permitting a flow of compressed gas into the cavity in a quantity which will permit some escape of gas from the cavity.

3,935,862
INHIBITION OF CONDITIONS ARISING FROM MICROBIAL PRODUCTION OF AMMONIA

Kenneth S. Kraskin, Milltown, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed June 12, 1974, Ser. No. 478,663
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 1 Claim

1. A disposable diaper comprising a thin, waterproof backing sheet and a thin, moisture permeable facing sheet and an absorbent core disposed between said facing and said backing sheets, said diaper containing on at least the upper portions, including the surface area of the absorbent core or moisture permeable facing sheet first to intercept urine in use, a means for inhibiting ammonia formation therein including an aminopolycarboxylic acid compound in an amount of at least 0.001 gm. per square inch.

3,935,863

SURGICAL SPONGE

Herbert L. Kliger, 29 Harvard St., P.O. Box 541, Brookline Village, Mass. 02147

Filed July 19, 1974, Ser. No. 489,991
Int. Cl.² B32B *31/20*; A61F *13/00*; A61B *10/00*
U.S. Cl. 128—296 4 Claims

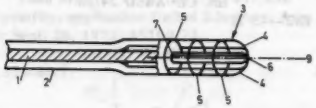
1. A surgical sponge for use in a body cavity comprising a porous sponge material pre-formed to provide a cup-shaped member having an internal opening and having a mouth to the internal opening dimensioned to freely receive the end of a suction tube, means for releasably securing the sponge to the end of said suction tube comprising an attaching cord having an adjustable tightening means on one end secured to the sponge adjacent the mouth thereof for attaching and securing said sponge to the suction tube said cord having a length such that the other end remote from the sponge can be disposed above a portion of the suction tube and sponge that remains outside the body cavity.

3,935,864

ENDOCARDIAL ELECTRODE

Hans Lagergren, Ostermalmsgatan 89, S11459, Stockholm, Sweden

Filed June 18, 1974, Ser. No. 480,536
Claims priority, application Germany, July 4, 1973, 2334049
Int. Cl.² A61N *1/04*
U.S. Cl. 128—418 20 Claims



1. Endocardial electrode for the intracardial stimulation of a heart, comprising an elongate electrical conductor; and electrical insulation encasing said conductor; and an electrode head being connected to said conductor at the end thereof proximate the heart for transmission of stimulative pulse to the heart upon insertion of said electrode, said electrode head having a plurality of electrically conductive contact portions connected to said conductor and defining spaces extending interiorly of said electrode head, said contact portions being shaped and positioned so as to form the external periphery-defining edges of at least one hollow body in said electrode head.

3,935,865

BRASSIERE

Julie Newmar, 12 Beekman Place, New York, N.Y. 10022

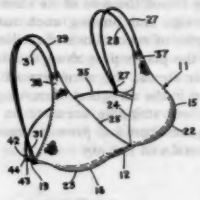
Filed Nov. 22, 1974, Ser. No. 526,319
Int. Cl.² A41C *3/00*
U.S. Cl. 128—488 9 Claims

1. A brassiere comprising:

a body engaging band extendable across a wearer's chest under her breasts and terminating in a left end under the left arm of the wearer and a right end under the right arm of the wearer,

a left and a right cup both connected to the band and adapted for receiving the wearer's left and right breasts respectively,

the left cup terminating in a left upper end which connects with at least two left shoulder cords spaceable from each other and extendable over the left shoulder of the wearer to connect with the left end of the body engaging band,



the right cup terminating in a right upper end which connects with at least two right shoulder cords separable from each other and extendable over the right shoulder of the wearer to connect with the right end of the body engaging band,

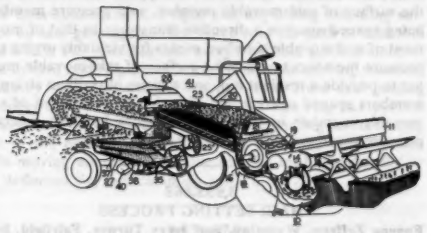
at least one closure cord connecting the left and the right ends of the band to each other.

3,935,866

GRAIN LOSS MONITOR

Edwin M. Northup, Milwaukee; David L. Moore, Brookfield, both of Wis., and J. Lyle Shaver, Blue Springs, Mo., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 23, 1974, Ser. No. 536,030
Int. Cl.² A01F *12/00*
U.S. Cl. 130—24 25 Claims



1. A grain loss per unit area monitor for a variable speed combine adapted to harvest a crop and recover grain therefrom comprising, in combination,

means including an electrical transducer adapted to be positioned in the flow path of grain in said combine for generating a grain flow rate signal which is a function of the number of grains of said crop impinging on said transducer,

means for deriving a ground speed signal which is a function of the ground speed of said combine, and

means for deriving a signal which is the analog of said grain flow rate signal divided by said ground speed signal, whereby said analog signal is indicative of grain loss per unit area and is independent of time.

3,935,867

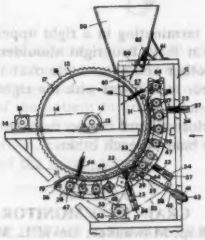
STRIPPING OF BRUSSELS SPROUTS FROM THEIR STEMS

George Wilfred Richardson, Barrow-on-Humber, England, assignor to Produits Findus S.A., Vevey, Switzerland

Filed June 17, 1974, Ser. No. 479,759
Int. Cl.² A01F *11/00*
U.S. Cl. 130—30 R 20 Claims

1. A method of stripping Brussels sprouts from their stems comprising the steps of; feeding the plants laterally in succes-

sion to the nip between a soft resilient surface of a movable member and a series of laterally spaced pressure members each having a soft resilient surface yieldably urged towards the surface of the movable member, moving said movable member relative the pressure members to cause rotation of each plant substantially about the axis of its stem as it passes into and through the nip, and passing each rotating plant into contact with a series of successions of resilient rotating stripping members as the plants pass along the nip to remove the sprouts from their stems, the members of each succession being spaced apart in the direction of movement of the plants and exerting resilient stripping pressure on the sprouts, the series of stripping members and pressure members alternating in the lateral direction of the nip.



2. Apparatus for stripping Brussels sprouts from their stems comprising a movable member having a soft resilient surface, a series of pressure members extending in the direction of movement of said movable member and each having a soft resilient surface arranged in spaced opposed relationship with the surface of said movable member, said pressure members being spaced apart in a direction transverse to that of movement of said movable member, means for yieldably urging said pressure members towards the surface of said movable member to provide a resilient nip, and a series of resilient stripping members spaced apart in the direction of movement of said movable member in each of the spaces between adjacent pressure members.

3,935,868

HAIR SETTING PROCESS

Eugene Zeffren, Wyoming, and Jerry Turner, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 294,053, Oct. 2, 1972, Pat. No. 3,805,809. This application Feb. 1, 1974, Ser. No. 438,816

Int. Cl.[2] A45D *7/00*

U.S. Cl. 132—7 **4 Claims**

1. A hair deforming composition in kit form comprising: (1) a separately packaged, water-based shampoo; and, (2) a separately packaged portion of an oxidant of the formula $MHSO_3$, wherein M is an alkali metal cation, said portion being sufficient to provide a concentration of oxidant in the shampoo of at least about 1% by weight.

3,935,869

APPLICATOR DRIVE UNIT

Arnold O. Winfried Reinsch, 13170 Carousel Lane, Del Mar, Calif. 92014

Continuation-in-part of Ser. No. 330,694, Feb. 6, 1973, abandoned. This application June 5, 1974, Ser. No. 476,717

Int. Cl.[2] A45D *24/16*

U.S. Cl. 132—9 **6 Claims**

1. An applicator drive unit for treating a surface comprising:

a casing;

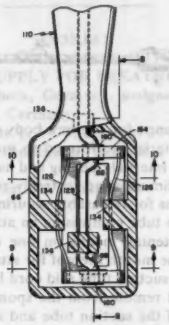
a pair of generally parallel rods mounted in said casing, each of said rods having a pair of eccentric portions;

a mounting bracket mounted to the eccentric portions of said rods;

an applicator element attached to said mounting bracket;

a motor operatively mounted in said casing;

power transmission means operatively connecting said motor and mounting bracket for driving said mounting bracket circularly on the eccentric portions of said rods



such that all portions of the applicator element have substantially translational circular motion whereby the orientation of the applicator element with respect to the casing is maintained substantially constant and the applicator has a lapping action in use to produce substantially one effective direction of motion relative to the surface treated.

3,935,870

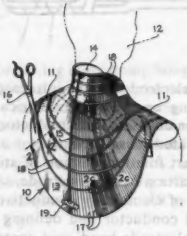
GUIDE MEANS FOR CUTTING HAIR

Albert Wall, 515 S. Crescent Ave., Lodi, Calif. 95240

Filed Aug. 7, 1974, Ser. No. 495,422

Int. Cl.[2] A45D *24/36*

U.S. Cl. 132—45 R **6 Claims**



1. A device for use in cutting long hair to an even length on opposite sides of a substantially vertical centerline defined to extend downwardly between the shoulders of a person, said device comprising a template of semi-rigid material formed to provide a broad surface including shoulder portions adapted to be draped over the shoulders and a back panel portion adapted to extend across the back of a person, said template including a collar portion open at one side to be yieldingly spread apart and disposed about the neck of the person for holding the template in place, said shoulder portions and said back panel portion merging with said collar portion all as a substantially continuous surface, a sufficient number of fine grooves formed to extend downwardly and laterally away from the neck portion on both sides of said centerline to inhibit lateral movement of strands of the hair in the contiguous layer of hair laid thereon, the depth of said grooves being sufficient to engage said strands to be restrained from lateral movement across said surface, and a predetermined pattern of hair length

defined on the surface of said back panel for guiding scissors of the barber in cutting the hair to conform to said pattern.

3,935,871

COLLAPSIBLE WIG STAND

Cecil Kern, North Miami, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 13, 1975, Ser. No. 586,596
Int. Cl.² A41G 5/00
U.S. Cl. 132—54 2 Claims

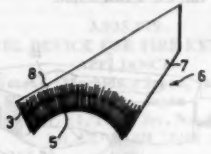
1. A collapsible wig stand comprising in combination an inflatable wig form attached to a collapsible purse-like bag having a drawstring for closing and carrying.

3,935,872

PACKAGING OF ARTIFICIAL EYELASHES

Eric V. Aylott, Cwmbran, England, assignor to Eylure Limited, England

Filed Mar. 1, 1974, Ser. No. 447,436
Claims priority, application United Kingdom, Aug. 3, 1973, 36971/73; Sept. 26, 1973, 45100/73
Int. Cl.² A45D 40/26
U.S. Cl. 132—88.7 3 Claims



1. An artificial eyelash set and applicator assembly wherein the eyelash set is convex in side elevation having a base strand and a plurality of lashes attached to the base strand and an applicator having a handle by means of which the applicator may be manipulated and a support upon which the eyelash set is mounted said eyelash set being removably secured along a tangent of the set with the convex side of the eyelash set in contact with and secured upon the support of the applicator so that the base strand is free of the applicator.

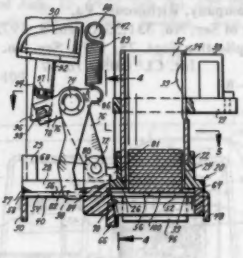
3,935,873

COIN-DISPENSING DEVICE

Raymond Arthur Johnson, Hot Springs, Ark., assignor to U.M.C. Industries, Inc., New York, N.Y.

Filed July 19, 1974, Ser. No. 490,133
Int. Cl.² G07D 1/00
U.S. Cl. 133—5 R 10 Claims

4. A coin-dispensing device which comprises a coin-holding tube, a holding surface adjacent one end of said coin-holding tube which can help hold a coin adjacent said one end of said coin-holding tube, a guiding member adjacent said one end of said coin-holding tube which can help guide a coin which is moved transversely away from said one end of said coin-holding tube, a coin-moving member movably mounted adjacent said one end of said coin-holding tube and adjacent said guiding member, means to move said coin-moving member transversely of said one end of said coin-holding tube, said coin-moving member having a ring-like portion with an inner diameter which is substantially larger than the inner diameter of said coin-holding tube, said ring-like portion of said coin-moving member and said one end of said coin-holding tube being oppositely disposed of said holding surface, said ring-like portion having a projection thereon which extends toward said



one end of said coin-holding tube and which has a coin-engaging surface thereon which can engage said coin and which can respond to movement of said coin-moving member in one direction transversely of said one end of said coin-holding tube to move said coin transversely away from said one end of said coin-holding tube, a rigid and unyielding camming surface on said guiding member which is in the path of said coin and which will cam said coin away from said guiding member and toward said ring-like portion of said coin-moving member, whereby said coin will be cammed away from said guiding member for movement to and through said ring-like portion of said coin-moving member, and said camming surface being out of the path of said coin-moving member, whereby said coin-moving member can move relative to, but not strike or be deflected by, said camming surface.

3,935,874

UMBRELLA ASSEMBLY

Helen Cohen, 251 Valentine St., Fall River, Mass. 02720

Filed Dec. 18, 1974, Ser. No. 533,815
Int. Cl.² A45B 11/00, 17/00, 25/24
U.S. Cl. 135—16 9 Claims

1. An umbrella assembly comprising an elongated generally cylindrical housing having a bottom end wall but open at its top end, a removable cover attachable to said top end for closing same, a collapsible umbrella mounted within said housing, said umbrella having a handle comprising a plurality

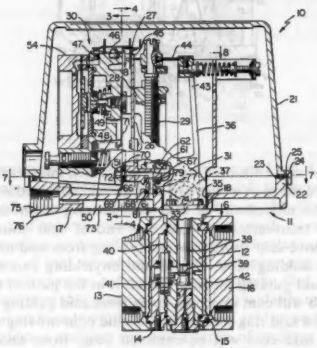
of interconnected extensible sections, means swivelly securing the bottom one of said sections to said housing bottom wall, said sections being dimensioned whereby when they are retracted and the umbrella collapsed, the entire umbrella fits within said housing, and when said sections are extended and the umbrella opened, said handle extends outwardly from said top end of said housing for a substantial distance, said swivel means permitting the extended handle to pivot within said housing until the handle engages the top edge of the latter.

3,935,875

PNEUMATICALLY OPERATED FORCE BALANCE TRANSMITTER AND METHOD OF MAKING THE SAME

George T. Hardin, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 331,337, Feb. 9, 1973, abandoned.
This application Sept. 25, 1974, Ser. No. 509,010
Int. Cl.² G05D *16/00*
U.S. Cl. 137—84 6 Claims



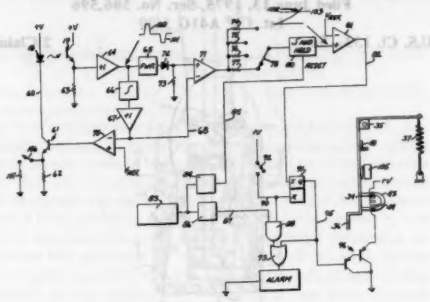
2. In a force balance transmitter having a base structure provided with passage means and a secondary assembly attached thereto that includes a pneumatically operated relay module detachably secured to said secondary assembly and having passage means, the improvement comprising a fluid transfer member disposed between said module and said base structure and interconnecting said passage means of said base structure to said passage means of said module, said fluid transfer member being carried by said secondary assembly and being spaced from said base structure, said fluid transfer member having means floatingly interconnecting with said passage means of said base structure to tend to isolate motion of at least part of said base structure from said module, said fluid transfer member having passage means therein that interconnect said passage means of said base structure with said passage means of said module, said floating means of said fluid transfer member comprising tubular means slidingly disposed for axial and non-rotational movement in said passage means of said fluid transfer member and said passage means of said base structure whereby axial sliding movement can take place between said tubular means and said passage means of said fluid transfer member and said base member in the assembled relation of said force balance transmitter, said secondary assembly incuding a bracket means and said base structure including a base and a main body, said bracket means and said base being mounted to said body, said base having said passage means of said base structure therein, said module and said fluid transfer members being detachably secured to said bracket means.

3,935,876

AIR LEAK DETECTOR

Harold Lee Massie, Minnetonka, and Louis C. Cosentino, Wayzata, both of Minn., assignors to Renal Systems, Inc., Minneapolis, Minn.

Filed Nov. 15, 1974, Ser. No. 524,329
Int. Cl.² A61M *5/14*; G08B *21/00*
U.S. Cl. 137—177 14 Claims



1. Apparatus for detecting presence of air in a fluid carrying tube, comprising:

a. optical sensing means for producing a signal in response to an air bubble in the fluid carrying tube;

b. integrating means connected to receive signals from said optical sensing means and operable to integrate said signals; and

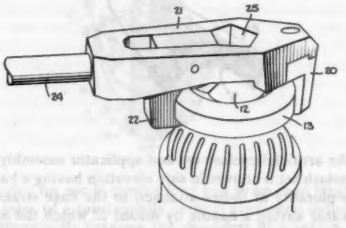
c. switching means connected to said integrating means, said switching means operable to change states when the integrated signal reaches a predetermined value, thereby providing an indication of excessive air in the fluid.

3,935,877

TAMPER-PROOF LOCKING SYSTEM FOR FIRE HYDRANTS

Peter A. Franceschi, 552 Van Ness Ave., Bronx, N.Y. 10460

Filed July 23, 1974, Ser. No. 491,470
Int. Cl.² F16K *35/06*
U.S. Cl. 137—296 8 Claims



1. A tamper-proof lock system for protecting the stem of a fire hydrant or similar apparatus against unauthorized turning thereof, said system comprising:

A. a cap assembly mountable on said stem and including a cap housing whose head has a circular array of sloped faces formed thereon, the housing having a central inner cavity dimensioned to receive and socket said stem whereby rotation of said housing causes rotation of said stem and a Saturn ring encircling said housing and linked thereto for relative rotation, and

B. a wrench cooperating with said cap assembly, said wrench having at least two sloped faces adapted to complement and engage corresponding faces in said array thereof on said cap housing, and a fixed claw cooperating

with an adjustable claw to grip said Saturn ring to provide purchase.

3,935,878

ARRANGEMENT IN HEAT INPUT TO A GULLY FOR DRAINING WATER IN ORDER TO AVOID ACCUMULATION OF SNOW AND ICE

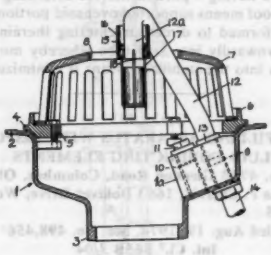
Petter P. Østevik, Storgaten 17, 6400 Molde, Norway

Filed May 14, 1974, Ser. No. 469,650

Claims priority, application Norway, May 30, 1973, 1753/73

Int. Cl.² F16K 49/00

U.S. Cl. 137—334 7 Claims



1. Arrangement in a gully for draining water in order to avoid accumulation of snow and ice therein, comprising a mainly cup-shaped gully member, having lower outlet socket for connection to a waste pipe and an upper circumferential support flange, a clamping ring secured on the upper end of said member, a circular vertical flange on said clamping ring to receive and guide an upper crown-shaped grate resting on said clamping ring and having an upper central opening, a bore through the wall of said cup-shaped member, a pipe for supply of heated air mounted in said bore with the mouth of its free end opening into said gully, means provided on said pipe for adjustable dispersion of the airstream from said pipe mouth below said grate and a float valve controlling said mouth.

3,935,879

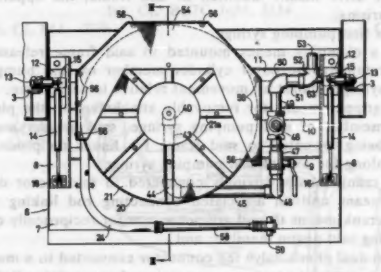
HOSE REEL DEVICE FOR FIRE EXTINGUISHING APPLIANCE

Tashirou Miyazaki, Machida, Japan, assignor to Nomi Bosaikogyo Kabushiki Kaisha, Japan

Filed Mar. 11, 1975, Ser. No. 557,290

Int. Cl.² B65H 75/34

U.S. Cl. 137—355.16 6 Claims



1. A hose reel device for fire extinguishing appliance of the type having a cabinet and a door, said device comprising hinge means to swingably connect the door to the cabinet for opening and closing the cabinet, said hinge means being mounted on the cabinet to provide for the door a swinging axis horizontal and parallel to the front side of the cabinet, a reel mounted on inside of the door and rotatable around an axis normal to the door, a hose wound onto the reel and fluidly connected to the water supply source and valve means controlling the water supply.

3,935,880

DEVICE FOR REDUCTION OF DISTURBING NOISE IN A FLOW CONTROL DEVICE

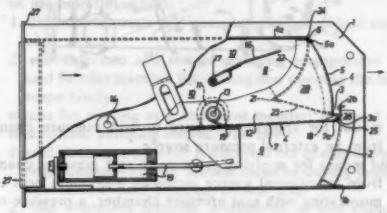
Lars-Erik E. Lindestrom, Kristinehamn, and Arne S. Wibring, Jonkoping, both of Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

Filed Aug. 23, 1974, Ser. No. 499,994

Claims priority, application Sweden, Aug. 24, 1973, 7311572

Int. Cl.² F24F 11/04

U.S. Cl. 137—499 7 Claims



1. In a casing having walls defining an air passage a flow control assembly of the type including a baffle or threshold projecting into the air passage from one wall of said casing toward an opposed wall of said casing, said threshold having an arcuate concave surface facing upstream, a plate or pressure plane disposed upstream of said threshold and mounted for rotation about an axis transverse to the axis of the casing such that its downstream end moves parallel to said arcuate face of said threshold, an arcuate valve blade carried at the downstream end of said pressure plane for forming an adjustable throttling gap between said threshold and said opposed wall of said casing, there being a fixed gap between said valve blade and said pressure plane, the improvement comprising air guiding means disposed upstream of said arcuate valve blade forming separate first and second channels leading to said adjustable throttling gap and to said fixed gap, respectively, said channels having cross sectional areas which decrease in the direction of air flow whereby air turbulence and associated noise in said gaps are reduced.

3,935,881

APPARATUS FOR STEADY-STATE VOLUME RATE FLOW CONTROL

Mandel L. Desnick, St. Louis Park, and Leonard J. Boler, Minneapolis, both of Minn., assignors to Cherne Industrial, Inc., Edina, Minn.

Filed Dec. 3, 1973, Ser. No. 420,790

Int. Cl.² G01F 11/00

U.S. Cl. 137—578 5 Claims

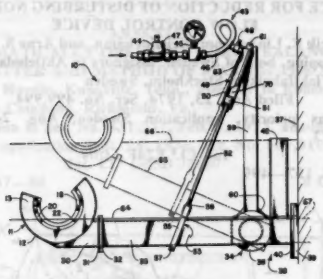
1. An apparatus for steady-state volume rate flow control from a variable depth liquid which comprises:

a floating weir having an inlet crest over which such liquid may flow when said weir is floated at a predetermined level therein and a discharge opening through which such liquid may flow from said weir; and

pressure responsive control means operatively connected to said floating weir for opposing the buoyancy of said weir to position said inlet crest of said weir at a selected distance below the surface of said variable depth liquid,

thereby establishing a desired steady-state volume rate of liquid flow from said weir through said discharge opening.

said pressure responsive control means including an air cylinder member, a piston member relatively movable therein along an axis having a substantial vertical component and defining a pressure chamber therein, one of said piston and cylinder members operatively connected to said weir and the other of said piston and cylinder members having means for connection to a support, and



means for applying pressure to said pressure chamber from an external pressure source,

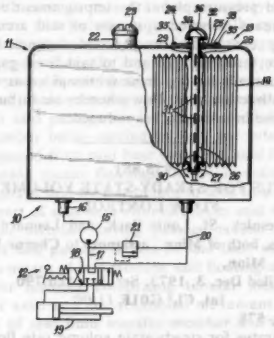
said means for applying pressure to said pressure chamber from an external source including a pressure port communicating with said pressure chamber, a pressure regulator communicating with said pressure port for controlling the pressure applied to said pressure chamber, and a pressure control bleed for controlling the pressure in said pressure chamber independent of relative movement of said piston member in said cylinder member.

3,935,882

HYDRAULIC TANK RESERVOIR PRESSURE AND VACUUM STABILIZER SYSTEM

Ralph W. Matthews, New Berlin, Wis., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 19, 1974, Ser. No. 443,303
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **2 Claims**



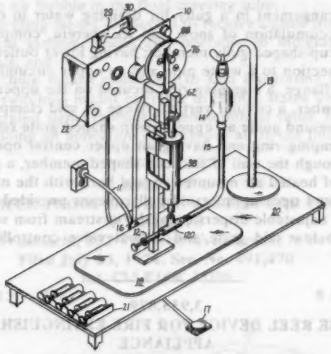
1. In an hydraulic system comprising a sealed reservoir tank, and a displacement-type hydraulic element in communication with said tank for receiving hydraulic fluid from and returning hydraulic fluid to said sealed reservoir tank; a stabilizer means for changing the volume of the sealed reservoir tank in response to fluid requirements of the displacement type hydraulic element, the stabilizer means comprising an accordion type air bag having walls defining a variable volume chamber, at least one of said walls being movable and having its outer surface in communication with the interior of said sealed reservoir tank, said air bag being formed with sufficient resiliency to resist complete collapsing by the pressure generated from the weight of hydraulic fluid in the sealed reservoir when said sealed reservoir is filled, vent means for providing ingress and egress of ambient atmospheric air into and out of the variable volume chamber allowing substantially atmospheric pressure to be maintained in the sealed tank; the stabilizer means further comprising an elongated tube extending from the vent means, said tube being rigid and having one or more passages establishing communication between the inside of the tube and the inside of the variable volume chamber, said elongated tube having a portion thereof extending outwardly of said tank, roof means supported over said portion, said roof means being formed to direct air entering therein upwardly and then downwardly into said tube whereby movement of solid particles into the stabilizer means is minimized.

3,935,883

SYRINGE FILLING APPARATUS WITH DISPOSABLE FLUID CONDUCTING ELEMENTS

Paul E. Stach, 4743 Glendon Road, Columbus, Ohio 43229, and Thomas P. Sherrin, 1663 Dolliver Drive, Worthington, Ohio 43085

Filed Aug. 19, 1974, Ser. No. 498,456
Int. Cl.² B65B *3/04*
U.S. Cl. 141—27 **10 Claims**



1. An apparatus for filling injection syringes with medical fluid from a source container and including a support frame for positioning said apparatus in a suitable work area and a motor drive means mounted to said frame, the apparatus comprising:

a. a first pumping syringe;

b. a clamping means mounted to said frame releasably retaining the outer cylinder member of said pumping syringe against all movement relative to said frame;

c. gripper means for removable attachment to the piston member of said pumping syringe, said gripper means being mounted to said frame for linear reciprocation along the axis of said pumping syringe;

d. crank means drivingly connected to said motor drive means and an associated connecting rod linking said crank means to said gripper means for reciprocally driving said piston member; and

e. a dual check valve tee connector connected to a mating connector on said pumping syringe for permitting fluid to be drawn into and expelled from said pumping syringe, said tee connector having an input port for connection to said source container to permit the withdrawal of fluid from said container into said pumping syringe and also having an exhaust port formed into a female Luer con-

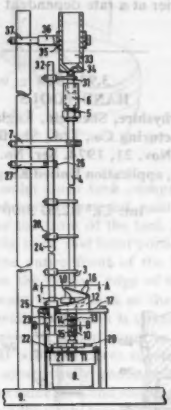
nector for receipt of an injection syringe and permitting fluid flow from said pumping syringe to said injection syringe.

3,935,884

COLUMN PACKING DEVICE

Heath Robin Hazelton, Orpington, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed May 23, 1974, Ser. No. 472,667
Int. Cl.² B65B *1/22*
U.S. Cl. 141—80 **14 Claims**



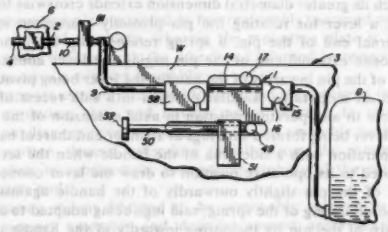
13. In a chromatographic column packing machine which includes means for supporting a chromatographic column for rotating and vertical motion, the improvement of a chromatographic column drive plate, drive means for vertically moving and rotating said drive plate in order to rotate and vertically move the chromatographic column, and tapper means comprising a tapper shaft mounted for rotation and supporting a tapper member for impacting against said column, and means for intermittently rotating said tapper shaft in a first direction less than a complete revolution and thereafter releasing said tapper shaft to permit it to rotate in a direction opposite to said first direction.

3,935,885

CAPSULE-FILLING MACHINES

Richard R. Alter, 608 McDowell St., Delavan, Wis. 53115

Filed Feb. 1, 1974, Ser. No. 438,751
Int. Cl.² B67C *3/26, 3/34*
U.S. Cl. 141—279 **3 Claims**



1. In a capsule-filling machine embodying means for holding a capsule body portion in position to receive fluid therein,

a. a reservoir for holding a supply of such fluid.
b. a nozzle for feeding said fluid into a capsule body portion,
c. a flexible, resilient tubular member operatively connected between said reservoir and said nozzle for feeding such fluid there-between,
d. a drive shaft,
e. means for rotating said drive shaft,
f. means, including a cam mounted on said drive shaft, for pumping fluid through the tubular member from said reservoir to said nozzle,
g. means for moving said nozzle between
  1. One position wherein it is disposed in operative position in said body portion, and
  2. another position wherein it is disposed in outwardly spaced relation to said body portion,
h. said means for moving said nozzle comprising
  1. a second cam mounted on said drive shaft and rotatable with said first mentioned cam, and
  2. a cam follower connected to said nozzle and engaged with said second cam,
i. an abutment member
  1. disposed between said pumping means and said nozzle, and
  2. movable into and out of clamping engagement with said tubular member for closing and opening the latter, respectively,
j. means for moving said abutment member in timed relation to said pumping means, whereby
  1. said abutment member is disposed out of said clamping engagement with said tubular member during pumping operation of said pumping means, and
  2. said abutment member is disposed in said clamping engagement with said tubular member when said pumping means is not operating to pump fluid from said reservoir to said nozzle,
k. said means for moving said abutment member comprising a third cam mounted on said drive shaft and rotatable with said first mentioned cam and said second cam,
l. means for sensing whether a capsule body portion is disposed in said position to receive fluid therein, and
m. a solenoid operatively connected to said means for sensing, and controlled thereby, for rendering said abutment member inoperative to move out of said clamping engagement when a capsule body portion is not disposed in said position to receive fluid therein.

3,935,886

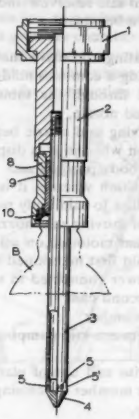
FILLER TUBE

Alexander R. Duncan, Scarborough, Canada, assignor to The Molsons Companies Limited, Rexdale, Canada

Filed Feb. 5, 1974, Ser. No. 439,966
Claims priority, application Canada, July 31, 1973, 177748
Int. Cl.² B65B *3/04*
U.S. Cl. 141—392 **1 Claim**

1. A bottle filler tube assembly including a valve adaptor serving as the mounting for the upper end of an axially bored liquid filling tube of elongated tubular configuration, a downwardly and outwardly flared bottle centering housing directly and fixedly secured to the lower end of said adaptor and through which said tube passes, a gasket within said housing adapted to contact the upper end of a bottle to be filled, the tip of said tube being closed and tapered at 30° to the longitu-

dinal axis of said tube, the lower end of said tube having a reduced diameter peripheral groove portion through which



extend a plurality of circumferentially unobstructed spaced filler holes.

3,935,887

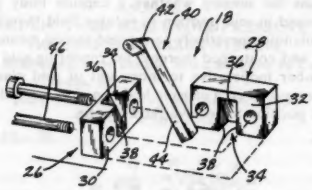
CUTTER DISC

William R. Van Zante, 922-1/2 Main St., and Alonzo Ver Ploeg, Rte. 2, both of Pella, Iowa 50219

Filed June 14, 1974, Ser. No. 479,365

Int. Cl.² B27G *13/04*; B27C *1/00*, *9/00*

U.S. Cl. 144—235 **10 Claims**



1. A cutter disc, comprising,

a rotatable cutter disc having a center axis of rotation,

a plurality of cutter tools mounted on said disc radially outwardly of said center axis of rotation,

said cutter tools each including a holder and a bit, said bit having a cutting head and shank, said holder having a pair of half sections having mating faces parallel to said disc, said half sections having a slot formed in their mating faces and extending diagonally thereto with said bit shank positioned in said slot, and locking means interconnecting said half sections to hold said bit and secure said cutter tool to said disc with said bit extending at an acute angle to said disc.

3,935,888

MANUFACTURE OF VENEER SHEETS

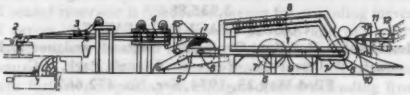
Peter K. Hörnig, Berlin, Germany, assignor to C.L.P. Fleck Sohne GmbH, Berlin, Germany

Filed Nov. 6, 1973, Ser. No. 413,375

Int. Cl.² B27H *1/00*; B65H *39/16*

U.S. Cl. 144—327 **1 Claim**

1. A method of manufacturing veneer sheets comprising the steps of cutting a plurality of individual veneer sheets, arranging the cut sheets into an adjacent, aligned, relationship, winding the said cut sheets into a roll, conveying said roll of cut sheets to a storage device, and thereafter unwinding the sheets from said roll of cut sheets in said storage device, and feeding



the sheets to a drier at a rate dependent on the output of the drier.

3,935,889

HAND TOOLS

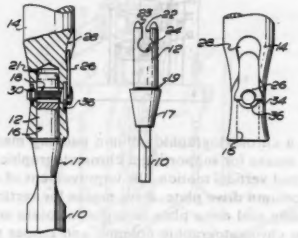
George Cecil Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Co., Ltd., Sheffield, England

Filed Nov. 21, 1974, Ser. No. 526,042

Claims priority, application United Kingdom, Nov. 28, 1973, 55259/73

Int. Cl.² B25D *3/00*

U.S. Cl. 145—24 **1 Claim**



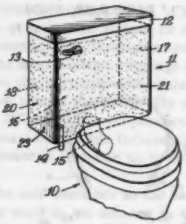
1. In a hand tool including a tool part provided with a tang having an axially extending slot in its free end opening into a cross hole, the diameter of the cross hole being greater than the width of the slot, and including a handle part having an aperture extending axially into one end for receiving the tang; locking means for locking the handle part to the tang comprising a locking pin extending diametrically through the handle intermediately of the ends of the aperture and adapted to be rotated relative to the handle, the pin having a first narrow diametrical dimension allowing sliding reception of the pin down the slot into the cross hole and having perpendicular to the first dimension a second diametral dimension greater than the width of the slot allowing locking of the pin against escape from the slot when the pin is rotated to a locking position in which its greater diametral dimension extends crosswise to the slot, a lever for rotating the pin pivotally connected to an external end of the pin, a spring retainer clip fitted on an opposite external end of the pin urging the lever connected end of the pin inwardly of the handle, the lever being pivotable from an inoperative angular position in a side recess of the handle to an operative position in axial extension of the pin, the lever being formed with lugs at an inner end thereof having cooperation with a side area of the handle when the lever is pivoted to its operative position to draw the lever connected end of the pin slightly outwardly of the handle against the opposed urging of the spring, said lugs being adapted to allow return of the pin by the spring inwardly of the handle upon pivoting the lever back to its inoperative position, and the said urging of the spring serving to retain the lever in its inoperative position.

3,935,890

COVER FOR TOILET TANKS

Seymour S. Dolnick, Milwaukee, Wis., assignor to Glen Mfg. Inc., Milwaukee, Wis.

Filed Apr. 28, 1975, Ser. No. 572,611
Int. Cl.[2] A47K 13/00
U.S. Cl. 150—52 R 1 Claim



1. A cover for a toilet flush tank comprising a generally rectangular jacket of textile material, said jacket having a front portion to cover the front of the tank and side portions to cover the sides of the tank, said front portion having a width sufficient to cover the entire front of the flush tank and a height to extend from the bottom edge of the tank to above the normal level of water in the tank so that at least a major portion of the front wall of the tank is covered thereby, each of said side panels having a height equal to the front portion but having a narrower width to cover substantially the entire side of the tank, a substantially continuous sheet of vapor barrier material of the same size and shape as the jacket, said sheet having one side adhesively secured over substantially its entire area to the entire area of the back of said jacket and the other side of said sheet being provided with an adhesive coating over the entire surface thereof, and a layer of material covering the entire other side of said sheet and peelable therefrom to expose said adhesive coating whereby said material may be peeled from said other side of the sheet and said other side may be applied to the flush tank to cover substantially the entire front and side walls thereof in intimate contact throughout the entire covered area thereof.

3,935,891

TIRE TRACTION DEVICE

Marvin H. McCloud, Tucson, Ariz., and Delores J. McCloud, Stevensville, Mont., assignors to Marvin H. McCloud, Sr., Tucson, Ariz.

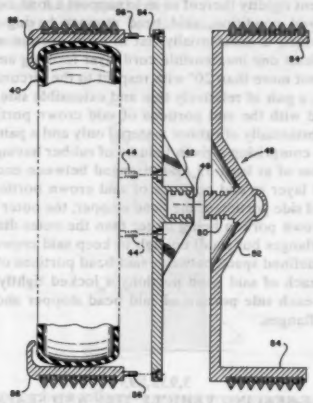
Filed Dec. 18, 1974, Ser. No. 533,850
Int. Cl.[2] B60C 27/07
U.S. Cl. 152—225 R 1 Claim

1. An improved tire traction device defining an auxiliary structure for use with wheeled vehicles with tires to provide for increased traction for the vehicle when it is moving over unstable ground, the improved device comprising, in combination:

a mounting plate adapted to be (removably) secured to the wheel of a vehicle, wherein the mounting plate is integrally defined with the wheel and adapted to removably receive a support assembly;

a support assembly adapted to be removably secured to the mounting plate and having means thereon to receive auxiliary gripping devices, the support assembly having a portion thereof extending radially from the mounting plate to substantially the outer periphery of the vehicle tire; and

gripping means adapted to be removably secured to the support assembly and defining spaced apart auxiliary traction means to define increased gripping action for the vehicle when moving over unstable ground wherein the gripping means are threadably received within the means provided on the support assembly and wherein the gripping means are secured to the support assembly such that they extend over the outer periphery of the tires of the vehicle in spaced apart relation about the periphery to define an increased traction means for the vehicle and



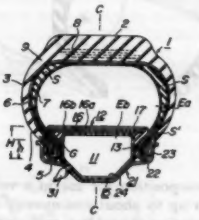
extention, gripping means adapted to be mounted on the support assembly such that they extend laterally outwardly of the outer periphery of the tire to define increased traction area for the device thereby spreading the driving force over a larger area.

3,935,892

PNEUMATIC TIRED WHEEL

Iwao Arimura, Kodaira; Yasuo Suzuki, Akigawa; Akira Matsuda, and Akio Sato, both of Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company, Ltd., Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,766
Claims priority, application Japan, June 21, 1973, 48-69144
Int. Cl.[2] B60C 5/06, 17/00
U.S. Cl. 152—330 RF 19 Claims



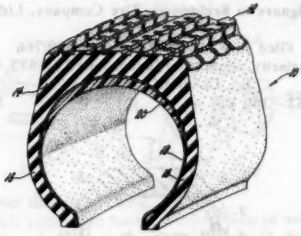
1. In a pneumatic tired wheel including a tubeless tire having a relatively thick tread portion, a pair of side portions extending from said tread portion, a pair of bead portions extending from said side portions, a carcass embedded in said side portions across said bead portions, said bead portions being stiffened with at least one additional reinforcing layer disposed therein, an elastic bead stopper having an independent and air-tight chamber inscribed within said bead portions, a rim having a pair of flanges; the improvements comprising a pair of elastic reinforcements having a Shore A hardness of at least 47 and extending along said side portions and formed integral therewith, the thickness of said elastic reinforcements gradually decreasing toward their associated bead portions and toward the center of said tread portion, with the maximum thickness adjacent said side portions being

from 3 to 15 percent of the maximum width of the tire when it is inflated, and each end portion of said elastic reinforcements overlapping said additional reinforcing layer in said bead portion and the thickened tread portion, thereby to supplement the thickness of said side portions and to enhance the inherent rigidity thereof so as to support a load even under a punctured condition, said bead stopper having a crown portion which is substantially flat in cross section and comprises at least one inextensible cord layer forming an angle of cords of not more than 20° with respect to the circumferential direction, a pair of relatively thin and extensible side portions associated with the end portions of said crown portion comprised substantially of rubber material only and a pair of space members comprising a given volume of rubber having a Shore A hardness of at least 55 and arranged between each end of said cord layer in end portions of said crown portion and its associated side portion of the bead stopper, the outer diameter of said crown portion being larger than the outer diameter of said rim flanges but small enough to keep said crown portion within a defined space between said bead portions of the tire, thereby each of said bead portions is locked tightly in place between each side portion of said bead stopper and each of said rim flanges.

3,935,893
SELF-SEALING VEHICLE TIRE AND SEALANT COMPOSITION

Peter L. Stang, Bellevue, and Joel V. Van Ornum, Kirkland, both of Wash., assignors to General Motors Corporation, Detroit, Mich.

Filed July 15, 1974, Ser. No. 488,563
Int. Cl.² B60C *5/14, 17/00*
U.S. Cl. 152—347 **4 Claims**



1. A sealant composition for use in a vehicle tire to seal punctures therein up to about one-quarter inch in diameter formed in the operation of said tire, said composition consisting essentially of, by weight,

10 to 15 parts of a butyl rubber having an average molecular weight in the range of about 100,000 to 300,000,

6 to 10 parts of a butyl rubber having an average molecular weight in the range of about 10,000 to 30,000,

60 to 65 parts of a liquid polybutylene having an average molecular weight of about 500 to 5,000,

5 parts of a partially hydrogenated thermoplastic elastomeric block copolymer having the general molecular configuration A-(B-A)$_{1-5}$ wherein, prior to hydrogenation, each A is a monovinyl arene polymer block and each B is a conjugated diene polymer block, and only said diene block(s) are hydrogenated,

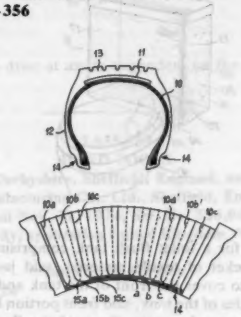
5 to 17 parts carbon black,

and small but suitable amounts of crosslinking agents suitable for curing butyl rubbers.

3,935,894
TIRE HAVING ENDS OF CARCASS CORDS EXTENDING CIRCUMFERENTIALLY IN BEAD AREA

Jacques Pouilloux, Gratien, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Filed Mar. 27, 1975, Ser. No. 562,397
Claims priority, application France, Mar. 29, 1974, 74.11084
Int. Cl.² B60C *9/08, 15/04*
U.S. Cl. 152—356 **10 Claims**

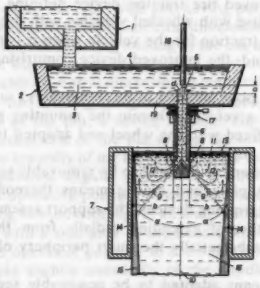


1. A tire of the pneumatic type having a tread, sidewalls, a radial carcass within said sidewalls and extending under said tread, and beads at the rim engaging edges of said sidewalls, said carcass being formed of individual meridian arcs of reinforcing cords or cables with the ends of the individual cords or cables being bent in an area of each bead to provide cable portions that extend circumferentially in each bead, the circumferentially extending portions of one cord or cable being juxtaposed with respect to circumferentially extending portions of the adjoining cords or cables to form longitudinal bundles of cords or cables which make up a reinforcing structure of the beads.

3,935,895
CONTINUOUS STEEL CASTING METHOD

Thorwald Fastner; Alois Niedermayr; Ernst Bachner, and Herbert Bumberger, all of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed June 3, 1974, Ser. No. 476,066
Claims priority, application Austria, June 14, 1973, 5222/73
Int. Cl.² B22D *27/18, 11/10*
U.S. Cl. 164—56 **12 Claims**



1. In a continuous steel casting method for a casting capacity of more than 1.5 metric tons of steel per minute, wherein at least one stream of molten steel is formed and cast into a

vertically arranged, substantially rectangular mold, having a larger transverse axis and a smaller transverse axis, through a casting tube having a certain clear cross section and extending to below the level of molten steel in the mold, said casting tube having lateral, downwardly directed outlet openings whose axes lie in a vertical plane running through the larger transverse axis of the mold, the outlet openings having a certain perpendicular distance from a narrow side of the mold, and wherein said at least one stream of molten steel contains inert gas, the improvement comprising:

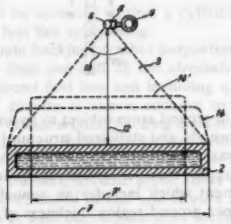
casting the at least one stream of molten steel, having a certain cross section, through a casting tube, in which the axes of the lateral outlet openings run at an angle dependent upon the perpendicular distance of said axes from the narrow side of the mold, this angle amounting maximally to 20° when the perpendicular distance is 40 cm and the maximum angle increasing linearly with respect to an increase in distance up to 50° at a distance of 120 cm; and

supplying the said inert gas to the said at least one stream of molten steel in an amount in the range of 1 to 15 Ncm^3/kg steel over the entire cross section of the stream of molten steel at the place of origin of said at least one stream of molten steel above the mold.

3,935,896
METHOD FOR COOLING A CONTINUOUSLY CAST STRAND

Richard J. Tegtmeier, Newtown, Pa.; Jimmy L. Helms, Ridgewood, and Karl L. Backhaus, West New York, both of N.J., assignors to Concast Incorporated, New York, N.Y.

Division of Ser. No. 324,541, Jan. 16, 1973, Pat. No. 3,877,510. This application Feb. 28, 1974, Ser. No. 447,006
Int. Cl.² B29D 11/124
U.S. Cl. 164—89 22 Claims



9. A method of cooling a continuously cast strand in a secondary cooling zone of a continuous casting plant, comprising the steps of arranging a spray nozzle at the region of at least two consecutive spaced guiding means for guiding the cast strand along a predetermined path of travel, moving a cast strand along said predetermined path of travel defined by said spaced guiding means, feeding liquid coolant into the spray nozzle, forming from said liquid coolant a spray pattern which emanates from the spray nozzle and impinges the cast strand along an impingement area extending substantially transversely across the surface of the cast strand, and producing a distribution of liquid coolant over the impingement area of the strand which is substantially uniform at least over the major portion of the transverse width of the strand, in order to substantially uniformly cool the strand across its transverse width dimension, said major portion of the transverse width dimension amounting to at least about 60 percent of said transverse width dimension of the strand.

3,935,897
METHOD OF SOLAR HEATING AND COOLING

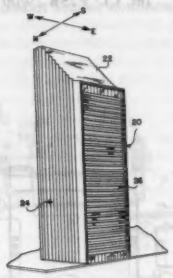
Donald W. Pulver, One Oliver Plaza, Pittsburgh, Pa. 15222

Filed Mar. 21, 1974, Ser. No. 453,239
Int. Cl.² F28F 21/00
U.S. Cl. 165—1 15 Claims

1. Method of solar heating and cooling in a building of the type having approximate north, east, west and south facades including insulated opaque areas and vision areas comprising:

A. orienting said vision areas, as follows:
   i. north facade-north
   ii. east facade-northeasterly
   iii. west facade-northwesterly
   iv. south facade-southerly;

B. shading said south facade vision area during summer months,



C. orienting heat collectors on said opaque areas as follows: east-southeasterly, west-southwesterly, south-southerly;

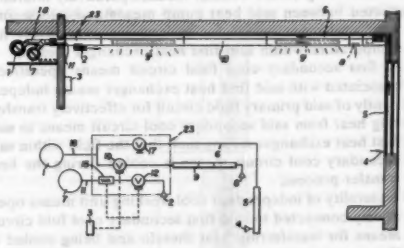
D. circulating heating and cooling fluid, so as to absorb heat of solar radiation from said collectors for purposes of winter heating and summer cooling, while

E. sequentially blocking circulating of said fluid in areas not exposed to the sun.

3,935,898
DEVICE FOR AIR-CONDITIONING A NUMBER OF ROOMS THE HEAT REQUIREMENTS OF WHICH ARE DIFFERENT AND VARY PREFERABLY WITH RESPECT TO TIME

Folke Westergren, Skarholmen, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Sept. 25, 1974, Ser. No. 509,126
Claims priority, application Sweden, Oct. 2, 1973, 7313422
Int. Cl.² F24F 3/00
U.S. Cl. 165—22 7 Claims



2. An individual room control device in a system for air-conditioning a number of rooms comprising means to introduce a flow of central air into said individual room at a temperature below the desired room temperature, a light fixture to supply additional heat to said room, means to discharge a first constant flow of discharge air from said room, means to discharge a second flow of discharge air from said room into heat exchange relation with said fixture to reduce the heat supplied to said room by said fixture, a thermostat fan sensing the temperature of said room, a discharge control device controlled in response to said thermostat for varying said

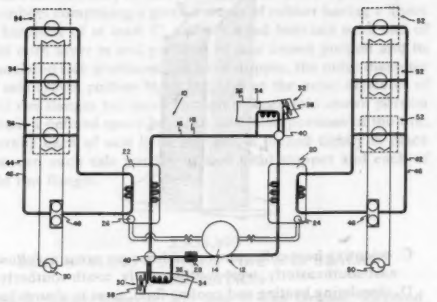
second flow between a minimum and a maximum, and an inlet control device controlled in response to thermostat to introduce central air in an amount corresponding to the sum of said first and second discharge flows.

3,935,899

INTEGRATED THERMAL ENERGY CONTROL SYSTEM USING A HEAT PUMP

Steven E. Jolly, P.O. Box 834, Ely, Nev. 89301

Filed June 28, 1974, Ser. No. 484,090
Int. Cl.[2] F25B 29/00
U.S. Cl. 165—29 12 Claims



1. An integrated thermal energy control system for thermally heating and cooling a plurality of independent cool and hot working units operatively connected within the system, said integrated thermal energy control system comprising:

a. a heat pump means for cooling and heating a working fluid;

b. said heat pump means having associated therewith a primary fluid circuit means having said working fluid contained therein;

c. a first relatively cool heat exchange means operatively associated with said primary circuit means;

d. a first temperature control means operatively interconnected between said heat pump means and first heat exchanger means for maintaining a relatively cool temperature within said first heat exchanger means;

e. a second relatively hot heat exchanger means operatively associated with said primary circuit means;

f. second temperature control means operatively interconnected between said heat pump means and said second heat exchanger means for maintaining a relatively hot temperature within said first heat exchanger means;

g. a first secondary cool fluid circuit means operatively associated with said first heat exchanger means independently of said primary fluid circuit for effectively transferring heat from said secondary cool circuit means to said first heat exchanger means such that the fluid within said secondary cool circuit means is cooled during the heat transfer process;

h. a plurality of independent cool working unit means operatively connected to said first secondary cool fuid circuit means for transferring heat thereto and being cooled in the process;

i. a second secondary hot fluid circuit means operatively associated with second heat exchanger means independently of said primary fluid circuit for receiving heat therefrom and consequently tending to cool said second heat exchanger means in the process;

j. a plurality of independent hot working unit means, completely independent of said cool working unit means, operatively connected to said secondary hot fluid circuit means for receiving heat therefrom;

k. control means associated with both said first and second secondary circuit means for enabling both said first and second secondary circuit means to function simultaneously and to simultaneously effectuate heat transfer between the two secondary circuits and respective independent cool and hot working unit means of the system, and control means including first secondary pump means and first control means operatively interconnected between at least one of said independent cool working unit means and said first secondary pump means for maintaining the working temperature of each respective cool working unit means at a desired level, said control means further including second secondary pump means and second control means operatively interconnected between at least one of said hot working unit means and said second secondary pump means for maintaining the working temperature of each respective hot working unit means at a desired level.

3,935,900

PERMAFROST STRUCTURAL SUPPORT WITH INTEGRAL HEAT PIPE MEANS

Elmer Dale Waters, Richland, Wash., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 174,687, Aug. 25, 1971, Pat. No. 3,788,389. This application Dec. 21, 1973, Ser. No. 427,255
Int. Cl.[2] F28D 15/00
U.S. Cl. 165—45 2 Claims

1. For use in ground areas subject to an annual freeze-thaw cycle, a lightweight and stabilized structural support installation in a permafrost environment, comprising:

a unitary support member for installation in said permafrost environment which includes an annually active freeze-thaw upper ground region thickness of generally frozen soil, said support member including integral heat pipe means comprising

a cylindrical tubular container having a lower and an upper portion and constructed only heavy and sturdy enough to serve as said support member for supporting associated structure, said lower container portion being installed directly in said permafrost environment and having a nominal diameter sufficiently large to provide adequate radial freezing of adjacent soil to produce a full jacket of frozen soil around said lower container portion and firm anchoring thereof in said permafrost environment to support said associated structure, a passive radiator form of heat exchanger coupled to said upper container portion, a charge of working fluid in said container, said fluid normally existing as a small quantity of liquid in said container with saturated vapor filling the remainder thereof, and flow means of a helical configuration provided over the length of the interior longitudinal wall of said lower container portion for generally directing and spreading condensate return flow thereover;

a layer of thermal insulation of sufficient thickness applied about the exterior longitudinal wall of said lower container portion over the length in said annually active freeze-thaw upper ground region thickness of generally frozen soil to minimize any heat transfer between said container and said annually active freeze-thaw upper

ground region, the entire cylindrical outer surface of said lower container portion below said annually active freeze-thaw upper ground region functioning as a direct heat transfer surface between said permafrost environment and said container; and

means for attaching the upper end of said container to said associated structure to be supported,

whereby heat picked up from said permafrost environment is transferred into said lower container portion and transported by said working fluid in vaporized form to said upper container portion coupled to said heat exchanger for transfer to a heat output environment accompanied with condensation of said vaporized working fluid for return to said lower container portion to repeat the cycle such that said soil adjacent thereto is stabilized in its frozen condition normally throughout the year by said integral heat pipe means of said support member.

3,935,901

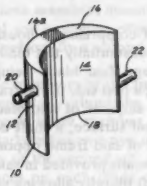
DIESEL FUEL LINE HEATER

Eldon E. Virgil, 2150 S. Galapago St., Denver, Colo. 80223

Filed June 3, 1974, Ser. No. 475,819

Int. Cl.² F02N *31/08*

U.S. Cl. 165—52 **3 Claims**



1. A heater to be mounted against a cylindrical side of a filter of a diesel fuel line comprising:

a. a metal arcuate backing member porportioned to extend around less than one-half of the circumference of the filter for a diesel fuel line and including quarter moon-shaped end closure members secured to the top and bottom ends of said arcuate backing member and forming therewith an inner, arcuate open side which is proportioned to lie against the cylindrical side of the filter.

b. a high heat transfer, arcuate metal sheet covering said inner open side, sealed to said end closure members and to the edges of said backing member forming a plenum chamber therewith, and having its inner surface approximately the same arcuate configuration as the filter so that said chamber fits closely to about one-half of the filter circumference and said backing member having a lesser radius of curvature to provide said plenum chamber with a thicker portion in the middle than at the ends;

c. an exhaust inlet means mounted in said backing member adjacent one edge and one end thereof, and an exhaust outlet mounted in said backing member adjacent the opposed edge and the opposite end thereof; and

d. means for securing said chamber to a filter member in a diesel fuel line.

3,935,902

CONDENSATION APPARATUS FOR STEAM TURBINE POWER PLANTS

László Heller; László Forgó; János Bódás, all of Budapest, Hungary; G. Sz. Agejev, and I. A. Alekszejev, both of Moscow, U.S.S.R., assignors to Tyeploelektroprojekt, Moscow, U.S.S.R. and Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat, Budapest, Hungary

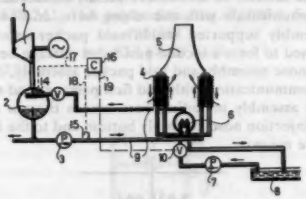
Filed Oct. 20, 1972, Ser. No. 299,501

Claims priority, application U.S.S.R., Oct. 25, 1971, 1710

Int. Cl. F28b *3/04*

U.S. Cl. 165—110 **8 Claims**

1. A condensation apparatus for steam turbine power plants comprising, in combination, a mixing condenser; a cooling system for cooling condensate withdrawn from said mixing condenser; first conduit means connecting said mixing condenser and said cooling system for flow of condensate from said condenser to said cooling system; second conduit means connecting said cooling system to said mixing condenser for flow of cooled condensate from said system to said condenser; first circulating pump means in one of said first and second conduits; said cooling system including an air-operated cooler incorporating a heat exchanger, an air supply means having an inlet passage, a liquid-operated cooler incorporating a heat exchanger, third conduit means connected for transferring



condensate from said first conduit means through said air-operated cooler and said liquid-operated cooler to said second conduit means, and second circulating pump means for circulating coolant liquid from an outside source through said liquid-operated cooler; sensors for determining the condensate temperature and the pressure in said mixing condenser; an adjustable valve positioned for adjusting the flow of coolant liquid to said liquid-operated cooler; and control means for receiving information from said sensors and adjusting said valve for optimum flow of coolant liquid in accordance with the information received.

3,935,903

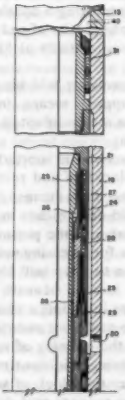
WELL TUBING PROTECTIVE FLUID INJECTION SYSTEM

Henry P. Arendt, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 2, 1975, Ser. No. 564,276

Int. Cl.² E21B *33/12*

U.S. Cl. 166—184 **9 Claims**



1. A well tubing protective fluid injection system adapted for use in a well that is equipped with casing, tubing, and a

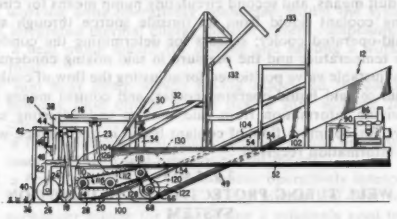
packer assembly—a casing annulus being formed between the casing and the tubing; said system including: a nipple assembly intermediate said tubing and said packer assembly; said nipple assembly including an opening between the casing annulus and the interior of said nipple assembly; a valve assembly inside said nipple assembly forming an annular opening between the exterior of said valve assembly and the interior of said nipple assembly; said valve assembly comprising check valve means, open at one end to the interior of said valve assembly, and at the other end, to said annular opening; sleeve means inside said valve assembly, and spaced from said valve assembly to form a first passage therebetween; said first passage being connected to said one end of said check valve means, the interior of said sleeve means connecting in open fluid communication with the tubing bore; and an injection nose assembly supported within said packer assembly and dimensioned to form a second passage, a passage between the injection nose assembly and said packer assembly, connected in fluid communication with said first passage; and said injection nose assembly including bore means therein extending from the injection nose assembly bottom end to the interior of said sleeve means.

3,935,904

METHOD AND APPARATUS FOR AUTOMATICALLY HARVESTING AND STACKING SOD

Martin Beck, P.O. Box 752, Auburn, Ala. 36830

Filed Apr. 19, 1974, Ser. No. 462,468
Int. Cl.² A01B *45/04*; B65G *57/00*
U.S. Cl. 172—20 **16 Claims**



1. A stacking apparatus for automatically and continuously harvesting and stacking blocks of sod, comprising:

cutter means for undercutting a continuous strip of sod for cutting said strip into blocks of sod;

conveyor means for sequentially picking up and transporting blocks of sod;

support means for receiving said blocks of sod from said conveyor, said support means including a normally closed, hinged door means adapted to pivot downwardly to an open position;

positioner means adjacent said support means for automatically positioning blocks of sod received from said conveyor on said hinged door means;

means for holding said door means in said closed position;

tripper means responsive to the presence of a block of sod on said door means for releasing said door, allowing said door means to open to drop said block of sod;

sod receiving means located beneath said support means, said receiving means including a platform vertically movable with respect to said door means to receive the block of sod released by the opening of said door means; and

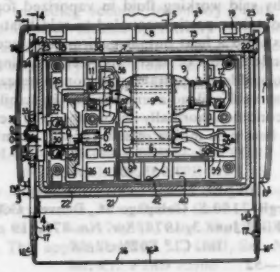
reset means for returning said door means to its normally closed position after the block of sod has been dropped on said platform to prepare said door means to receive the next block of sod in sequence from said conveyor, whereby said blocks are sequentially dropped on said platform to form a stack.

3,935,905

EARTH WORKING GARDENING TOOL

Francois Chery, Colombes, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Oct. 4, 1974, Ser. No. 512,145
Claims priority, application France, Oct. 5, 1973, 73.35626
Int. Cl.² A01B *35/00*, *35/32*
U.S. Cl. 172—40 **11 Claims**



1. A gardening tool comprising a housing, a substantially rectangular frame, a substantially flat blade defining two major parallel surfaces and said blade being mounted on the frame and constituting a first side of the frame for working the ground while said flat surfaces of said blade are substantially parallel with the ground surface, a shaft defining an axis and forming a second side of said frame opposite to the said first side thereof, bearing means provided in said housing for rotatably receiving said shaft thereby allowing pivotable movement of said frame about said axis, drive means disposed within the housing, transmission means also disposed within the housing and drivingly connecting the drive means to the frame to impart to the frame a continuous pivotal vibratory movement, and handling means connected to the housing for handling the tool.

3,935,906

ADJUSTABLE HEIGHT SOIL CONDITIONER WITH FRAME EXTENDING REARWARDLY FROM CULTIVATING IMPLEMENT

Archie E. Neal, and Paul Moore, both of Garfield, Wash., assignors to J. E. Love Company, Garfield, Wash.

Filed Sept. 20, 1974, Ser. No. 507,749
Int. Cl.² A01B *49/02*, *63/22*, *63/26*, *65/06*
U.S. Cl. 172—177 **3 Claims**

1. In combination with a tractor-driven cultivating implement, a soil conditioner for following the implement along a selected path of travel to condition the soil by breaking clods and prepare a seed bed within the soil behind the implement, said soil conditioner comprising:

a conditioner support frame extending rearwardly from said cultivating implement;

a transverse support bar extending transversly of said rearwardly extending support frame and supported thereby rearwardly of said cultivating implement;

an upright adjustable hanger member fixed to the transverse support bar and adjustably connected to the conditioner support frame for providing adjustable height support of said support bar relative to said support frame;

end hangers depending from the support bar;

a reel rotatably mounted on the end hangers and spaced from said support bar for free rotation about an axis transverse to said path;

adjusting means providing the adjustable connection between the upright adjustable hanger member and conditioner support frame comprising: a plurality of vertically spaced apertures formed through the hanger member with corresponding apertures formed through the conditioner support frame;

mounting nut and bolt assemblies extending through appropriate ones of said spaced apertures in the hanger member and aligned ones of said corresponding apertures in the support frame; and

upright adjusting bolt means operatively engaging the conditioner support frame and abutting the transverse support bar for raising and lowering the frame relative to the suport bar to bring selected ones of said spaced apertures of the hanger member into alignment with complementary one of said corresponding apertures in the conditioner support frame;

a first set of blade members mounted on said reel, having elongated axial soil-engaging edges parallel to said axis and spaced therefrom by a first radius;

a second set of blade members mounted on said reel having elongated axial soil-engaging edges parallel to said axis and spaced therefrom by a second radius that is less than the first radius;

wherein the blade members of the first and second sets are arranged equiangularly about the axis in alternating sequence with each blade member of the first set being centered angularly between a pair of adjacent ones of said blade members of the second set; and

planar side surfaces on each blade of both sets extending radially inwardly from said edge toward said axis.

3,935,907

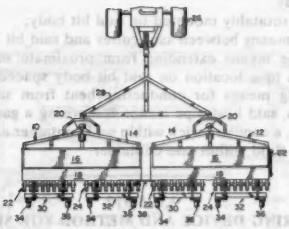
COUPLING ASSEMBLY FOR MULTIPLE IMPLEMENTS

John C. Riet, Burlington, Canada, assignor to International Harvester Company, Chicago, Ill.

Filed June 29, 1972, Ser. No. 267,298

Int. Cl.² A01B *49/00*

U.S. Cl. 172—314 **6 Claims**



3. A coupling assembly for connecting adjacent implements in end-to-end relation for towing in an endwise direction for transport and a direction lateral to the endwise direction for operation, said coupling assembly comprising:

an elongated bar coupled at one end to a first implement and extending in an endwise direction across the space between the first implement and a second implement, said bar including an elongated slot defined therethrough in an end thereof disposed adjacent to said second implement;

a bolt secured to said second implement and projecting in the lateral direction through said slot thereby permitting endwise movement between said implements during towing in the lateral direction;

a latch member pivotally mounted on said bolt, said latch member having a laterally extending lip portion on an end thereof, said latch member being movable to a position wherein said lip portion engages said end of said bar adjacent to said second implement to lock said bar against movement relative to said second implement whereby said implements are retained in fixed spaced relation for endwise towing.

3,935,908

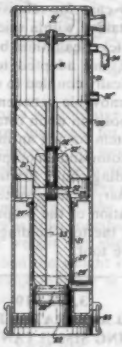
PILE HAMMERS

Charles R. Pepe, Old Quarry Road, Alpine, N.J. 07620

Continuation-in-part of Ser. No. 251,785, May 9, 1972, Pat. No. 3,838,741. This application Aug. 7, 1974, Ser. No. 495,381

Int. Cl.² E02D *7/10*

U.S. Cl. 173—127 **6 Claims**



1. A power hammer comprising:

a normally upright cylinder having a top, an upper portion and a lower portion;

an anvil at the lower end of the cylinder, the anvil having an upper face;

a ram in said cylinder operating in cooperative relation with the anvil, said ram being movable longitudinally between a lower position, wherein the ram is against the anvil, and an upper position, wherein the ram is away from the anvil and adjacent the upper end of the cylinder;

the ram having an upper end and a lower end, an upper lateral surface adjacent the upper end and a lower lateral surface located intermediate the upper end and a lower lateral surface located intermediate the upper end and lower end of the ram;

a longitudinal passage in the ram passing through the upper end thereof and a lateral opening connecting the passage with the exterior of the ram below the lower lateral surface thereof;

a tube carrying a piston valve element positioned within the passage to register with the opening in the down position of the ram and enable communication between the interior of the tube and the lower portion of the cylinder at the lower lateral surface of the ram in the down position; and

sealing means on said tube for sealing said opening from said passage until the ram is adjacent the upper position thereof, wherein the opening communicates with the upper portion of the cylinder at the upper surface of the ram, through said passage while, at the same time, connecting the passage with the exterior of the ram below the lower lateral surface thereof;

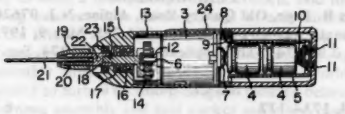
said upper surface of the ram having a larger area than the lower surface of the ram.

3,935,909

ELECTRIC HAND TOOL

Kenichi Mabuchi, Tokyo, and Yoshihisa Tsuchimochi, Ichikawa, both of Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Aug. 20, 1974, Ser. No. 498,981
Claims priority, application Japan, Aug. 28, 1973, 48-100918
Int. Cl.² H02K 7/14
U.S. Cl. 173—163 2 Claims



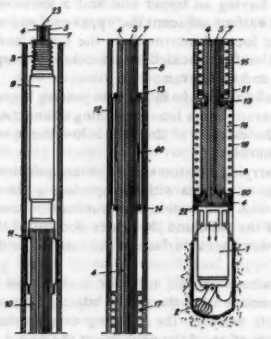
1. An electric hand tool comprising a body case, a cell case coupled to said body case for relative rotation with respect thereto, a motor contained within said body case and including an output shaft, nickel-cadmium battery means contained within said cell case and adapted to energize said motor, contact means electrically coupled to said battery means, said contact means being movable between a circuit open position and a circuit closed position upon rotation of said cell case, a planetary gearing system having an input end coupled to the output shaft of said motor and an output end journalled in said body case, a tool holding chuck drivingly coupled to the output end of said planetary gearing system and means for selectively preventing rotation of the output end of said planetary gearing system when the tool holding chuck is to be opened for the removal of the tool.

3,935,910

METHOD AND APPARATUS FOR MOULDING PROTECTIVE TUBING SIMULTANEOUSLY WITH BORE HOLE DRILLING

Claude Francois Gaudy, Bry-sur-Marne; Adrien Giraud, Neuilly; Claude J. Tassin, Courbevoie, and Christian H. Pech, Chatou, all of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed June 25, 1974, Ser. No. 482,703
Claims priority, application France, June 25, 1973, 73.23084
Int. Cl.² E21B 7/00
U.S. Cl. 175—17 20 Claims



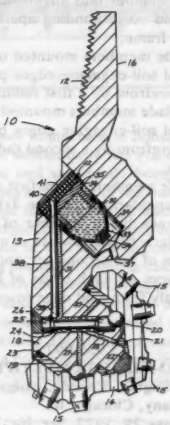
1. A machine for exploratory drilling comprising a drilling tool; a motor for rotating the tool; a supporting body, an inflatable sleeve former on said body for forming a sleeve, said sleeve former having heating elements and an injection zone at its lower end; an inflatable tubing former on said body disposed above said sleeve former, for forming a tubing, said tubing former having heating elements and an injection zone at its lower end; and feed circuits for feeding sleeve moulding material to the injection zone of the sleeve former and for feeding tubing moulding material to the injection zone of the tubing former, wherein said motor is mounted below said body.

3,935,911

EARTH BORING BIT WITH MEANS FOR CONDUCTING HEAT FROM THE BIT'S BEARINGS

Robert William McQueen, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 28, 1974, Ser. No. 484,049
Int. Cl.² E21B 7/00
U.S. Cl. 175—17 6 Claims



1. An earth boring bit for drilling under conditions that include heat being encountered in the bit during the drilling operation, comprising:

a bit body;

a cutter rotatably mounted on said bit body;

bearing means between said cutter and said bit body; and

heat pipe means extending from proximate said bearing means to a location on said bit body spaced from said bearing means for conducting heat from said bearing means, said heat pipe means comprising a gas tight container, a capillary wick within said container and a vaporizable fluid within said container.

3,935,912

ANCHORING DEVICE AND METHOD FOR SETTLING THE DEVICE IN THE GROUND

Mituo Shibata, No. 15-3, Oshima, 2-chome, Kawasaki, Kawasaki, Kanagawa, Japan

Continuation of Ser. No. 350,841, April 13, 1973, abandoned.
This application Dec. 30, 1974, Ser. No. 537,159
Int. Cl.² E02D 5/76
U.S. Cl. 175—264 10 Claims

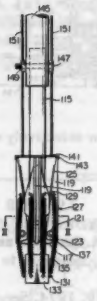
1. An anchoring device to be settled in a shaft in the ground for use in supporting a standing object on the ground, comprising:

a hollow vertical tubular rod open at its opposite ends along a central passageway therethrough;

a plurality of cutting arms, each comprising a support arm and a rigid fluke blade mounted thereon, the lowermost end of each support arm being pivotally connected with a first lower part of the tubular rod so that said support

arm is turnable about the connected end in a vertical plane including an axis of said tubular rod;

spring means having an end stationarily secured respective said tubular rod and operable to urge said cutting arms to outwardly turn about said connected ends of said support arms from a folded state in which said cutting arms are brought together about said tubular rod with the outer ends of said fluke blades above the connected ends of said support arms;



means for stationarily securing one end of said urging means on an external part of said tubular rod;

holding means for releasably restraining said cutting arms in the folded state, said holding means having a line means to release the restraint of said cutting arms above the ground surface; and

means for limiting the turn of said cutting arms to a selected acute angle from said folded state.

3,935,913

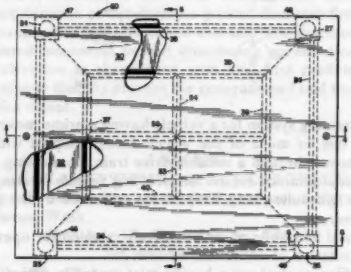
PLATFORM WEIGHING SCALE

Herbert A. Wagner, and Robert B. Katkov, both of Corona Del Mar, Calif., assignors to Howe Richardson Scale Company, Clifton, N.J.

Filed Oct. 18, 1974, Ser. No. 515,855

Int. Cl.² G01G *19/02, 21/22*

U.S. Cl. 177—134 **17 Claims**



1. A platform weighing scale comprising a multiplicity of load cells and a reinforced platform structure supported at spaced apart regions on said load cells, said platform structure including a load-receiving deck and deck reinforcing means fixed to the underside of said deck and cooperating with said deck to define a torsion box frame which resists deflection of said platform structure between said spaced apart regions, said torsion box frame having a perimeter which is defined by a multiplicity of leg portions, and each leg portion having two pairs of walls in which the walls of each pair are spaced apart from each other to define a quadrangular configuration in vertical cross section.

3,935,914

VEHICLE PLATFORM SCALE

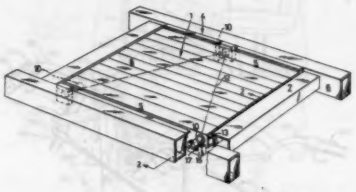
Kjell Helge Nordstrom, and Nils Göran Ahl, both of Vasteras, Sweden, assignors to Aktiebolaget Smaefa, Stockholm, Sweden

Filed Nov. 13, 1974, Ser. No. 523,352

Claims priority, application Sweden, Nov. 21, 1973, 7315757

Int. Cl.² G01G *19/02, 3/14*

U.S. Cl. 177—134 **4 Claims**



1. Vehicle scale having a weighbridge supported on a bed, characterized in that three load cells for sensing both upward and downward forces relative to the weighbridge are at their opposite ends secured between the weighbridge and the bed in such a manner that straight lines drawn from each load cell to each of the two remaining, define a triangular surface whereby the weighbridge is able, together with the load cells, to respond not only to weight but also to the overturning moments which arise when the weight resultant of a vehicle standing on the weighbridge in order to be weighed lies outside the triangular surface.

3,935,915

WEIGHING DEVICE

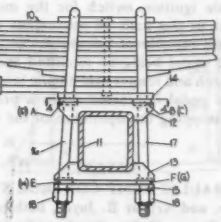
Alec Harry Seilly, North Wembley; Kenneth Clive Scott, London, both of England, assignors to Simms Group Research & Development Limited, London, England

Filed Feb. 28, 1974, Ser. No. 446,679

Claims priority, application United Kingdom, Mar. 13, 1973, 12048/73

Int. Cl.² G01G *19/12*

U.S. Cl. 177—136 **15 Claims**



1. A wheeled vehicle of the kind including a wheel carrying axle, the load carrying portion of the vehicle being carried by supports which are clamped to the axle and there being interposed between the supports and the axle, annular force sensing elements operable to provide an electrical signal indicative of the load transmitted to the axle by the supports including the clamping force clamping the support to the axle, the vehicle including in association with each support a further annular force sensing element which is positioned so as to be subjected only to the clamping force clamping the support to the axle, the first mentioned element and the further element

being electrically connected so that the resultant signal is independent of the clamping force and is dependent only upon the force transmitted to the axle by the support with the clamping force having been cancelled out electrically.

3,935,916

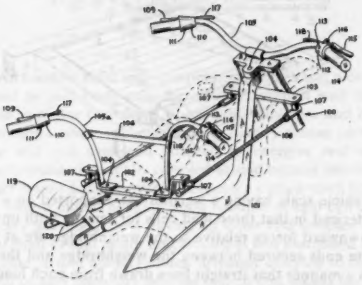
DUAL CONTROL SYSTEM FOR MOTORCYCLE INSTRUCTION

Thomas A. Ferraro, 6 Nassau Place, Cos Cob, Conn. 06807

Continuation-in-part of Ser. No. 382,493, July 25, 1973, abandoned. This application June 10, 1974, Ser. No. 477,926

Int. Cl. B62l *3/04*; B62k *7/00*

U.S. Cl. 180—33 R **7 Claims**



1. In a braking system and a motor control for a motorcycle having a main pedal operated brake assembly including a main brake cable or rod operatively connected to a rear wheel braking device; the invention comprising a combination auxiliary safety brake and a motor control device, said auxiliary safety brake including an auxiliary brake pedal mounted rearward of the main brake pedal and adapted to be operated by a rider sitting behind the motorcycle operator, an auxiliary brake cable having normally more slack than said main brake cable and being responsive to the movement of said auxiliary brake pedal and additionally operatively connected to said rear wheel braking device but being arranged to be inoperative when said main brake pedal is actuated and being operative when the rider presses down on the auxiliary brake pedal to pull the auxiliary brake cable thereby braking the motorcycle independently of the operation of the main brake pedal, means for adjusting the looseness of said auxiliary brake cable, and a resettable ignition switch for the motorcycle engine being mounted in the path of movement of said auxiliary brake pedal and capable of being reset only manually, said auxiliary brake pedal being so mounted and constructed to operate the switch and render said engine inoperative after the auxiliary brake pedal is pressed down a predetermined distance thereby stopping the operation of the engine.

3,935,917

HYDRAULIC PUMP CONTROL SYSTEM

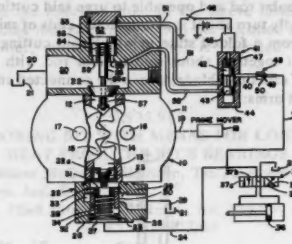
James M. Eley, and Arthur B. Joyce, both of Corinth, Miss., assignors to Tyrone Hydraulics, Inc., Corinth, Miss.

Filed Oct. 18, 1974, Ser. No. 515,990

Int. Cl.[2] B62D *5/08*

U.S. Cl. 180—53 R **10 Claims**

1. In equipment having a variable speed motive power means for operation of a first mechanism throughout a range of speeds and a second mechanism which is fluid operated; a pump driven by said motive power means at all times when said power means is in operation, said pump having supply and discharge passages for delivering operating fluid from a fluid reservoir to said second mechanism; a control system for said pump comprising first valve means in the supply passage for said pump for interrupting the flow of operating fluid to said pump, second valve means in the discharge passage of said pump and operable to prevent the return of fluid to the pump



and a control means for selectively operating said first valve means.

3,935,918

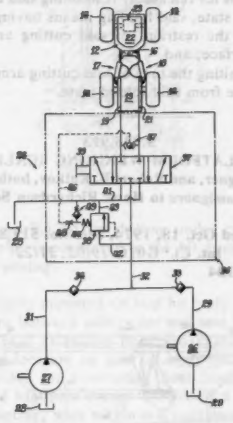
DUAL SOURCE HYDRAULIC STEERING SYSTEM

Leon E. Hicks; Wayne A. Peterson, and Lawrence F. Schexnayder, all of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 9, 1974, Ser. No. 504,055

Int. Cl.[2] B62D *5/08*

U.S. Cl. 180—79.2 R **9 Claims**



1. A steering system for a vehicle having a prime mover and wheels, one or more of the wheels being coupled with the prime mover through a suitable drive train, comprising

a hydraulic motor means for effecting vehicle steering,

a first hydraulic pump coupled for operation by the prime mover,

a second hydraulic pump effectively coupled for operation by rotation of one of the wheels,

a steering control valve having inlet means in communication with the two pumps and outlet means in communication with the steering motor means, the control valve being operable to selectively communicate both of the first and second pumps with the steering motor means, and

a fluid responsive inlet relief valve means communicating the inlet means of the control valve with a drain, the relief valve means being in communication with the outlet means of the control valve by a signal conduit, the relief valve means including means responsive to fluid pressure from the signal conduit for causing the relief valve means

to selectively limit fluid communication from the inlet means to the drain.

3,935,919

AUTOMATIC SEAT BELT LOCKING SYSTEM FOR VEHICLE

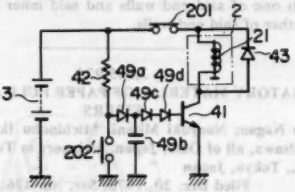
Takahide Kawamura, Toyota; Muneki Yoshino, Toyokawa, and Koichi Taniguchi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 26, 1974, Ser. No. 454,915

Claims priority, application Japan, Mar. 27, 1973, 48-35291; May 8, 1973, 48-51318

Int. Cl.² B60R *21/10*

U.S. Cl. 180—82 C 7 Claims



1. An automatic seat belt locking system for a vehicle comprising:

first and second detectors for detecting an acceleration or deceleration of a vehicle whereby a first detection signal is generated by said first detector when said acceleration or deceleration is greater than a first predetermined value, and a second detection signal is generated by said second detector when said acceleration or deceleration is greater than a second predetermined value which is greater than said first predetermined value;

a switching circuit connected to said first and second detectors and being turned off when at least one of said first and second detector signals is received; and

a locking mechanism connected to said switching circuit for locking and preventing the movement of a seat belt securing a vehicle occupant when said switching circuit is turned off wherein said first detector includes absorbing means wherein a transient, intermittent, disturbance acceleration or deceleration greater than said first predetermined value is absorbed and said first detector is rendered insensitive to said disturbance acceleration or deceleration in accordance with said first predetermined value to thereby prevent the generation of said first detection signal.

3,935,920

GRILLE SYSTEM FOR TILT CAB TRUCK

Douglas W. Schiel, Pleasanton, Calif., assignor to Paccar Inc., Bellevue, Wash.

Filed July 17, 1974, Ser. No. 489,177

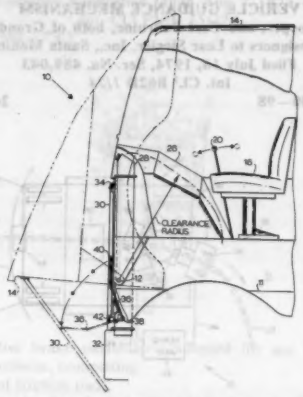
Int. Cl.² B60R *19/00*

U.S. Cl. 180—89 A 7 Claims

1. A grille system for a tilt cab-over-engine truck of the kind in which the cab is pivotally connected to the truck chassis for forward tilting about a cab pivot axis from a cab driving dposition to a cab tilted position to provide access to the engine and radiator area by raising a cab tunnel which normally covers the top of the engine and radiator area in said cab driving position, said grille system comprising,

a one-piece grille connected to the cab so as to be positioned upright in front of the radiator with the lower end of the grille extending downward below the cab pivot axis in the cab driving position,

and mounting means for automatically swinging the grille forward in a controlled path away from the cab and radiator as the cab is tilted to the cab tilted position,



said mounting means including a hinge connection between the grille and the cab at the upper edge of the grille and rigid guide rod means having one end connected to the grille and an opposite end connected to the truck chassis for controlling the path of travel of the grille in said swinging movement of the grille.

3,935,921

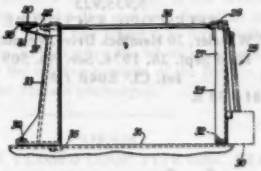
ENGINE ENCLOSURE HAVING A COUNTERWEIGHT MOUNTING DEVICE SECURED THEREON

Thomas P. Muller, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 326,996, Jan. 26, 1973, Pat. No. 3,869,018. This application Sept. 12, 1974, Ser. No. 505,587

Int. Cl. B62d *33/06*

U.S. Cl. 180—89 R 3 Claims



1. An enclosure comprising:

a horizontally disposed and longitudinally extending main frame,

at least one pair of upright rear posts secured at their lower ends on a rearward end of said frame,

at least one pair of upright center posts secured at their lower ends on said frame and spaced longitudinally forwardly from said rear posts intermediate forward and rearward ends thereof to extend upwardly therefrom,

force transmitting means interconnecting upper ends of each pair of said rear and center posts for transmitting loading forces imposed on said rear posts to said center posts and frame directly, and

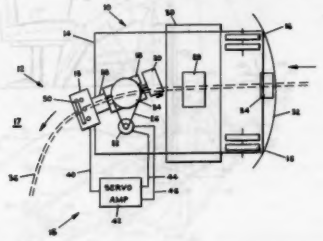
a counterweight mounting device secured on the outside of said rear posts to form an integral part thereof for selectively mounting a counterweight thereon.

3,935,922

VEHICLE GUIDANCE MECHANISM

Jack A. Cooper, and Carl Debruine, both of Grand Rapids, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed July 16, 1974, Ser. No. 489,043
Int. Cl.² B62D 1/24
U.S. Cl. 180—98 24 Claims



1. Vehicle guidance means for guiding a vehicle along a surface, said guidance means comprising a guide line which is substantially invisible under ordinary ambient lighting conditions and which contains material that emits radiation in a first frequency range in response to stimulation by radiation in a second frequency range, said guidance means further comprising:

radiation means in the vehicle adapted to direct radiation in said second frequency range on the guide line so as to cause the guide line to emit said first frequency radiation;

sensor means mounted in the vehicle and adapted to sense the first frequency radiation emitted by the guide line and in response thereto to generate an error output signal representative of the variation of the vehicle position from a predetermined lateral position with respect to the guide line; and

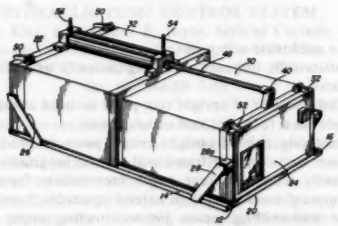
control means in the vehicle adapted to steer the vehicle in response to the error signal generated by the sensor means so as to maintain the vehicle in said predetermined lateral position with respect to the guide line as the vehicle moves along the guide line.

3,935,923

TELESCOPIC ENCLOSURE

Richard T. Wheeler, 20 Hemlock Drive, Vernon, Conn. 06086

Filed Sept. 26, 1974, Ser. No. 509,544
Int. Cl.² E04B 1/82
U.S. Cl. 181—33 K 7 Claims



1. An enclosure for reducing the noise pollution caused by a machine tool or the like, said enclosure comprising:

a. an outer housing of inverted U-shape configuration having a top wall and generally vertically extending side walls,

b. an inner housing also of inverted U-shaped configuration and also having a top wall and vertically extending side walls,

c. longitudinally extending inner and outer sets of tracks for slidably receiving said inner and outer housings such that said housings are movable with respect to one another between telescoped and extended positions,

d. end walls carried by said tracks for closing opposite ends of said inner and outer housings when each is in its extended position with respect to the other, whereby an enclosure is defined for the machine tool,

e. means for moving said housings with respect to one another and comprising a first part carried by said outer housing and a second part movable with respect to the first and carried by said inner housing, and

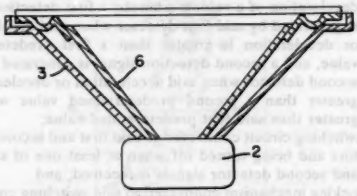
f. latching means for releasably securing said outer housing to one of said end walls and said inner housing to the other of said end walls.

3,935,924

VIBRATORY MATERIAL OF PAPER PULP AND CARBON FIBERS

Shozo Nagao; Naoyuki Mitani; Michinobu Ikuta, and Kenji Fujisawa, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 20, 1973, Ser. No. 426,574
Int. Cl.² G10K 13/00; H04R 7/00
U.S. Cl. 181—169 14 Claims



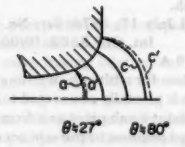
1. A vibratory plate comprising a substantially uniform mixture of paper pulp having a maximum beating degree of about 300 cc. of Canadian standard freeness and carbon fibers having a Young's modulus of at least about 8000 kg/mm².

3,935,925

HORN UNIT FOR A SPEAKER

Kenji Koiwa, and Makoto Kohashi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Claims priority, application Japan, Nov. 6, 1972, 47-110331
Int. Cl.² G10K 11/00
U.S. Cl. 181—192 7 Claims



1. A horn unit for use in a speaker comprising a horn including a mouth, a throat, and a horn wall section connecting said throat and mouth, said horn wall section defining a linear

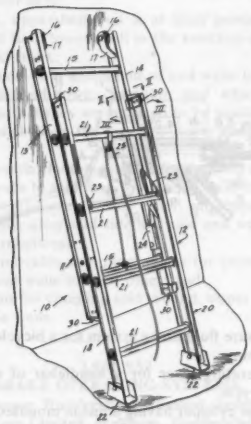
longitudinal axis of the horn, said horn wall section having a continuous configuration which is formed in such a way that at least two curves having different flaring constants are connected with each other with the differential coefficients of the respective curves caused to substantially coincide with each other at the connecting point, and the curve near the mouth being so shaped that the flaring constant of the curve is greater than that of the curve near the throat, said curve at the mouth having a large flaring angle at least greater than 60°.

3,935,926

EXTENSION LADDER

Jerry Allan Butler, Waterloo, Iowa, assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Oct. 9, 1974, Ser. No. 513,310
Int. Cl.² E06C 1/12
U.S. Cl. 182—208 16 Claims



1. An extension ladder assembly including a pair of ladder sections including a base section and a fly section, each of said base and fly sections including a pair of side rails and a plurality of rungs interconnecting the side rails of each of the sections respectively, the side rails of said fly section and said base section being disposed adjacent each other, each of said side rails including a central web portion and a pair of flanges formed at opposite longitudinal edges of said web portion, a first pair of guide means fixedly attached at the upper end of the side rails of said base section and a second pair of guide means fixedly attached at the lower end of the side rails of said fly section, said guide means also including means for receiving therein the flange of the adjacent side rail, wherein the improvement comprises,

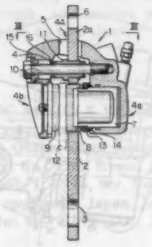
a guide means which includes a base portion for attaching to the web portion of a side rail and a pad means formed thereon so that in the extension ladder assembly said pad means will extend through a flange of a side rail to which it is attached and will slidingly engage the flange of an adjacent side rail to which said guide means is not fixedly attached.

3,935,927

DISC BRAKE FOR USE IN TWO-WHEELED VEHICLE

Tetsuo Haraikawa, Funabashi, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed July 22, 1974, Ser. No. 490,707
Claims priority, application Japan, Aug. 7, 1973, 48-88645
Int. Cl.² F16D 55/224
U.S. Cl. 188—73.3 1 Claim



1. A disc brake particularly adapted for use in a two-wheeled vehicle, comprising:

a pair of friction pads;

a C-shaped caliper body having a hole therethrough in a top portion thereof, and having a cylinder in one leg portion thereof into which hydraulic pressure can be supplied, the other leg portion thereof having one of said friction pads thereon opposite said cylinder;

a piston having one end slidably inserted into said cylinder and to the other end of which is fixed the other friction pad;

a caliper axle fixed to said caliper and extending parallel with the axis of said cylinder;

a collar slidably mounted on said caliper axle; and

a supporting bracket comprising a flat plate extending through the central space of said caliper body with one end of said bracket extending through the hole in the top portion of said C-shaped caliper body and having a hole in said one end for pivotally mounting said bracket on the axis of a wheel coaxially therewith and having a hole in the other end for pivotally mounting said bracket to one end of a link member, a further hole between said two first-mentioned holes in which said collar is fixed, and a still further hole in which is slidably mounted the other friction pad;

whereby said bracket can be positioned with the one end pivoted on the axle of the wheel of the motor vehicle coaxially with a brake disc and with the other end pivotally connected to the link which is in turn pivoted to the vehicle frame, so that when the wheel is adjusted relative to the frame the relative position of the friction pads and the brake disc remain unchanged.

3,935,928

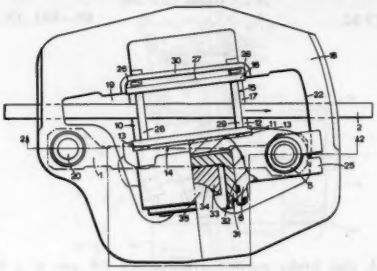
PIVOTABLE CLOSED LOOP TYPE DISC BRAKE

Hugh Grenville Margetts, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed June 27, 1974, Ser. No. 483,811
Claims priority, application United Kingdom, June 27, 1973, 30570/73
Int. Cl.² F16D 65/20
U.S. Cl. 188—73.4 3 Claims

3. A brake for a vehicle comprising a rotatable braking member, opposite faces of said braking member defining opposed braking surfaces, first and second friction members for engagement with said braking surfaces, support members carrying said friction members, separate pivots lying adjacent to one of said braking surfaces and about which said support members are independently mounted for angular movement, said pivots being spaced circumferentially relative to the axis

of said braking member and being so constructed and arranged that the drag on said friction members produces a self-energising effect to increase the force with which said friction members are applied to said braking member, wherein said support member carrying said first friction member for engagement with said one braking surface comprises an arm, said support member carrying said second friction member comprises a yoke which extends over said rotatable braking



member, and an hydraulic actuator acts between said arm and said yoke to apply said friction members to said rotatable braking member, said hydraulic actuator comprising an hydraulic piston working in a cylinder bore in said arm and a thrust block through which said piston acts on said yoke, said thrust block having a flat face for sliding engagement with said piston and an opposed concave face, said yoke including a part having rocking engagement with said concave face of said thrust block.

3,935,929

VEHICLE WHEEL BRAKES

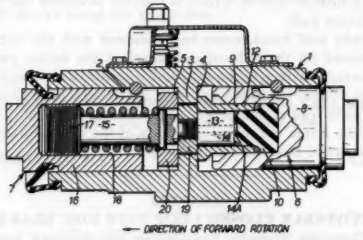
Andrew Charles Walden Wright, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 28, 1974, Ser. No. 501,294

Claims priority, application United Kingdom, Aug. 29, 1973, 40701/73

Int. Cl.² F16D 51/48

U.S. Cl. 188—331 **4 Claims**



1. An abutment assembly for an internal shoe drum brake, comprising a pair of tappet assemblies having opposed first and second abutment members for engagement with the ends of respective brake shoes, means defining a recess in said first abutment member, and force-transmitting means for transmitting forces between the abutment members, said force transmitting means including a sleeve member slideably received in said recess, a piston member slideably rceived in said sleeve member, one of said piston and sleeve members being in force transmitting relation with the second abutment member, and deformable means of elastomeric material contained within said recess in said first abutment member and engaging on one side the first abutment member, a part of the other side of the deformable means extending into said sleeve member and into engagement with said piston member therein, and the other part of said other side being in engagement with said sleeve member, the areas of engagement of the respective parts with said sleeve member and with said piston member being different from the area of the first side of the deformable means in engagement with said first abutment member, a fixed member engageable by one of said piston and sleeve members to retain said one of said piston and sleeve members stationary when a force is applied to said first abutment member to move it and the other of said piston and sleeve members relative to the one of said members and transmit to said second abutment member through said deformable means only a part of the thrust applied to said first abutment member.

3,935,930

FLUID PRESSURE BRAKING SYSTEM FOR A BICYCLE

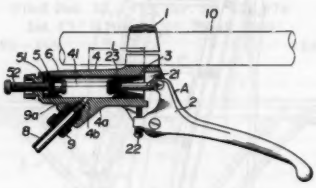
Masayoshi Kine, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Apr. 29, 1974, Ser. No. 465,134

Claims priority, application Japan, May 4, 1973, 48-52941

Int. Cl.² B60T 11/22

U.S. Cl. 188—344 **3 Claims**



1. A pressure fluid brake system for a bicycle or a motorcycle, comprising;

a. an operating lever for a handlebar of said bicycle or motorcycle,

b. a master cylinder having a piston mounted for movement with and by said operating lever from one end thereof, said master cylinder being longitudinally extended at the other end thereof to a length greater than the pressure stroke of said piston so as to form a reserve chamber in said cylinder, said reserve chamber being at the other end portion of the cylinder,

c. an adjusting member in said reserve chamber for changing the volume of said reserve chamber, said adjusting member having a portion thereof projected outwardly of said extended portion so as to be operable from the outside of said reserve chamber,

d. a braking mechanism mounted on a wheel of the bicycle or motorcycle, said braking mechanism having a body with a slave cylinder having a piston mounted for movement co-operable with motion of the piston of said master cylinder,

e. a pressure fluid supply conduit connecting said master cylinder with said slave piston of the braking mechanism, said conduit opening into said master cylinder at a position intermediate the ends thereof, said conduit and said cylinders being filled with fluid such as oil,

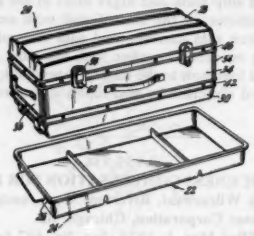
f. said adjusting member which changes the volume of said reserve chamber being the only means compensating for leakage of fluid and wear of the braking mechanism, and

g. the piston in the master cylinder and the adjusting member being coaxial with the longitudinal axis of the master cylinder.

3,935,931
KNOCKED-DOWN TRUNK

Arnold Kaplan, 1319 Auerback Ave., Hewlett Harbor, N.Y. 13654

Filed Aug. 15, 1974, Ser. No. 497,552
Int. Cl.² A45C 5/00
U.S. Cl. 190—19 **19 Claims**

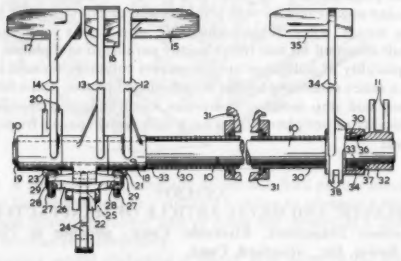


1. A trunk adapted to be erected from a knocked-down condition said trunk comprising:
   a. a first, lower shell;
   b. a second, uppershell that is at least partially nestable within said first, lower shell in the knocked-down condition of said trunk;
   c. a pair of side walls and a pair of end walls that are loose in the knocked-down condition and which are constructed so that they are adapted to be positioned within one of said shells in the knocked-down condition of said trunk;
   d. first removable clamping means for securing said side and said end walls to said first, lower shell, said first clamping means comprising inner and outer, ringshaped members to each other after said side and said end walls are positioned therebetween;
   e. second removable clamping means for joining said side and said end walls to each other; and
   f. hinge means for coupling said second, upper shell to one of said side walls.

3,935,932
BRAKE OPERATING SYSTEMS

Stephen Moorhouse, Huddersfield, England, assignor to David Brown Tractors Limited, Meltham, Huddersfield, England

Filed June 17, 1974, Ser. No. 480,250
Int. Cl.² F16D 67/02; G05G 9/00
U.S. Cl. 192—13 R **12 Claims**

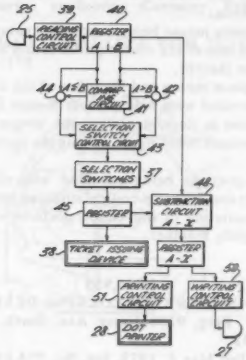


1. A clutch and steering brake operating system for an agricultural tractor comprising four levers pivotable about a common axis and each carrying a foot pedal, three of said levers being brake levers disposed side-by-side and the remaining lever being a clutch-operating lever, one of the two outer brake levers being arranged to operate the brake on one side of the tractor, the other of the two outer brake levers being arranged to operate the brake on the other side of the tractor, and the middle brake lever constituting a master brake lever, a pivotally mounted cross-bar on said master brake lever arranged to operate both of said outer levers with an equalising action when the master brake lever is operated, a shaft mounted to rock about said axis and upon which one of said outer levers is rigidly secured and the two other brake levers are pivotally mounted, a sleeve mounted on the tractor and co-axially surrounding said shaft which extends relatively rotatably therethrough, and means pivotally mounting a clutch-operating lever on said sleeve.

3,935,933
AUTOMATIC ARTICLE VENDING MACHINE

Toshio Tanaka, Kyoto; Mamoru Hirayama, Takatsuki, and Noriaki Minami, Osaka, all of Japan, assignors to Omron Tateisi Electronics Co., Ltd., Kyoto, Japan

Filed July 1, 1974, Ser. No. 484,597
Claims priority, application Japan, July 5, 1973, 48-76732
Int. Cl.² G07F 1/06, 7/02
U.S. Cl. 194—4 R **12 Claims**



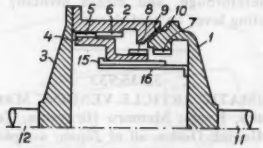
1. An automatic article vending apparatus, comprising:
means for receiving a stored value card having recorded thereon a first monetary value corresponding to the remaining stored value of said card, said card also having recorded thereon a second monetary value which is less than said remaining stored value and corresponds to a predetermined monetary limit for a single purchase of articles from the apparatus by the customer;
means for reading said first and second monetary values;
means for entering into the apparatus a third monetary value corresponding to the value of an article selected by a customer;
means for comparing said first and second monetary values and for providing a comparator output signal indicative of the lower value therebetween;
means dispensing said selected article to the customer;
control means responsive to said comparator output signal and operative to control said dispensing means such that it dispenses said selected article to the customer only when said third monetary value is no greater than the lower of said first and second monetary values;
means for updating said first monetary value to substract said third monetary value; and,
means returning said card to the customer.

3,935,934

RELEASABLE AXIAL CLUTCH

Lars Norberg, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Norrkoping, Sweden

Filed July 1, 1974, Ser. No. 484,595
Claims priority, application Sweden, July 5, 1973, 7394591
Int. Cl.[2] F16D *41/00, 11/00, 23/02*
U.S. Cl. 192—46 4 Claims



1. A releasable, self-locking axial clutch for firmly coupling together two shafts comprising:

two clutch portions each of which is secured to one shaft end and axially movable in relation to each other for pressing tightly together,

an axially displaceable clutch piece means provided between the two clutch portions for transmitting a torque therebetween,

the clutch piece means being in constant rotational engagement with one of the clutch portions and axially slidable in relation thereto,

the clutch piece means and the other of the clutch portions being provided with helical teeth means for selflocking engagement in dependence on the torque between the clutch portions resulting in drawing the portions together, and

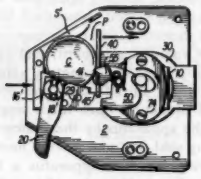
the clutch portions being provided with complementary outwardly and inwardly conical surfaces, respectively, for mutual centering of the clutch portions when they are drawn tightly together.

3,935,935

COIN OPERATED LOCKING DEVICE

Robert D. W. Berg, 9200 Upton Ave. South, Bloomington, Minn. 55431

Filed May 5, 1975, Ser. No. 574,525
Int. Cl.[2] G07F *17/14*
U.S. Cl. 194—78 12 Claims



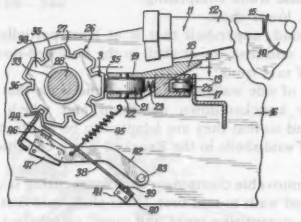
1. A coin operated lock device comprising a lock case and a bolt slideably mounted in said case between a sliding plate and a cover, said bolt being horizontally reciprocable to a forward locked direction and to a rear retracted direction responsive to the rotary movements of a lock plug of a lock plug assembly supported on said cover, said plug having a tenon and said tenon extending through slot means in said sliding plate, whereby the rotary movements of the tenon are transmitted to substantially horizontal movements of said plate, a spring-biased pawl being pivoted to said lock plug assembly and a coin carriage assembly being mounted on said sliding plate, a stop plate connected to said bolt and having a horizontal foot that is slideably received in an elongated slot of said sliding plate for limited movement therein, a coin receiving pocket being formed in said carriage assembly with said stop plate at the forward side of the pocket, said pawl having a ratchet that is biased to normally engage the foot of said stop plane and prevent horizontal movement of the stop plate together with the sliding plate and carriage assembly, the foot of said stop plate being positioned to allow said ratchet to ride over the foot when the edge of a coin in said pocket bears on said stop plate and urges same in the forward direction, the diameter of the rim of said coin comprising link means between said carriage and said stop plate, said link means being movable together with the stop plate carriage assembly and lock bolt to the latter's extended locked position in the forward direction by said tenon during rotation of said plug.

3,935,936

MEDIA THICKNESS COMPENSATION FOR PRINT HEAD

Robert Hugh Wilczewski, Riverton, Wyo., assignor to Victor Comptometer Corporation, Chicago, Ill.

Filed Mar. 1, 1974, Ser. No. 447,142
Int. Cl.[2] B41J *3/50*
U.S. Cl. 197—1 R 7 Claims



1. In a high-speed serial-type wire printer having a frame, a platen mounted on said frame for backing impresseion-receiving media, a carriage movable transversely of said platen, a print head carried by said carriage with printing wires reciprocable in a plane substantially at right angles to the surface of said platen to effect impressions against said media during transverse movement of the print head by said carriage along a print line on said platen; media thickness compensation means for maintaining said print head a predetermined distance from said media regardless of the thickness of the latter to accommodate media of different thicknesses disposed along said print line, comprising means for mounting said print head on said carriage for movement relative thereto perpendicular to said print line, biasing means for resiliently urging said print head away from said platen, and adjustable stop means engageable by said print head in response to said biasing means, wherein said adjustable stop means comprises a shaft mounted on said frame axially parallel to said platen, and a plurality of individual stop members rotatable on said shaft in a series extending for the length of said platen, and wherein each said stop member comprises a polyhedron presenting a plurality of peripheral faces each differently spaced from said shaft.

3,935,937

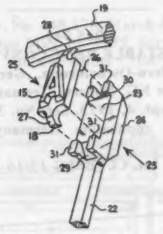
PLASTIC AND METAL ARTICLE OF MANUFACTURE

Herbert Tramposch, Riverside, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 413,782, Nov. 8, 1973, Pat. No. 3,859,712.
This application Sept. 12, 1974, Ser. No. 505,366
Int. Cl.[2] B41J *1/32*
U.S. Cl. 197—53 1 Claim

1. A plastic and metal printing disc assembly constructed of a composite of structural members, said printing disc assembly comprising:

a plastic disc shaped member having a hub portion which supports a plurality of flexible arms radially extending outwardly from said hub portion, an outer end of each of said arms having an end portion for receiving a type character member upon a flat face of each of said end portions, said end portions each having four corners, each of which contains a toe, each said face having two sloping recesses, each recess being disposed between two toes; and



a plurality of metal type character members annularly arranged with respect to each other, and each having two oppositely extending tabs, each tab nesting within a sloping recess of a corresponding end portion, said toes of each end portion being formed over said tabs to provide composite individual type and arm structures, said metal type character members each having a coating to provide a wear resistant surface thereon.

3,935,938

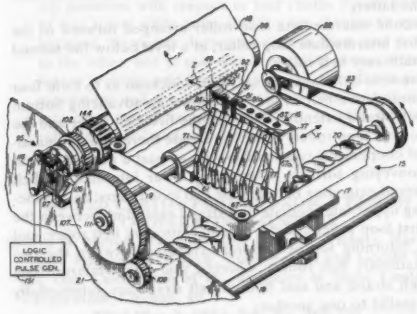
LINE FEED MECHANISM FOR PRINTER

Ingard B. Hodne, Northbrook, Ill., assignor to Teletype Corporation, Skokie, Ill.

Continuation of Ser. No. 468,048, May 8, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,928

Int. Cl.² B41J *19/92*

U.S. Cl. 197—114 R **17 Claims**



10. A compact, mechanically driven line feed printer mechanism for use in selectively rotating a platen to advance a print medium drawn thereover one or more line spaces at a time, said mechanism comprising:

coupling means including a platen gear adapted for coupling to an associated shaft of a platen, said platen gear being mounted for eccentric displacement relative to the axis of the platen shaft while remaining continuously coupled thereto;

drive means including a rotatably driven drive gear;

first controllably displaceable means for rotatably supporting said platen gear coaxially of said platen shaft;

ratchet means adapted for mounting on and rotation with the associated platen shaft;

second controllably displaceable means mounted so as to selectively engage said ratchet means; and

selectively energizable line feed actuator means responsively coupled to both said first and second displaceable means, said actuator means when energized in a correlated manner with said driven drive gear, causing said first means to be displaced from a first position whereat said platen gear is out of engagement with said drive gear to a second position whereat said gears are in coupling engagement, thereby imparting rotational movement to the associated platen then coupled thereto, and said actuator means when energized further causing at least in part said second means to be displaced from a first position in resiliently holding engagement with said ratchet means to a second position out of engagement with said ratchet means so as to release the associated platen for rotation.

3,935,939

AUTOMATIC THREADING OF A TYPING RIBBON

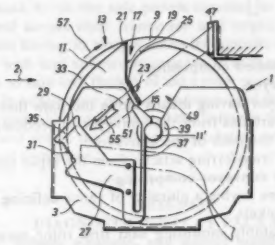
Uwe Schmidt, and Kurt Chvatlinsky, both of Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Feb. 25, 1974, Ser. No. 445,146

Claims priority, application Germany, Feb. 23, 1973, 2309017

Int. Cl.² B41J *33/14*; **B65H** *75/28*

U.S. Cl. 197—175 **7 Claims**



1. In a system for the automatic fastening of the free end of a ribbon to the core of a takeup reel in an office machine in which such reel is driven by a friction coupling, the reel including two flange parts enclosing the core, and the system including a guide member from which the ribbon is guided transversely across the edge of one of the two flange parts of the takeup reel in order to thread the ribbon, the one flange part being provided with a threading slit which increases in width in the direction from the reel core to the outer edge of the one flange part, with one side of said slit being defined by a catching edge inclined obliquely to the direction of rotation of the reel, rotation of the reel causing the ribbon to be gripped through the slit, carried along by the reel and wound around the reel core, the improvement wherein said one flange part is formed such that the end of said threading slit which is adjacent said reel core is tapered in the shape of a wedge which narrows toward said reel core and is provided with serrations for gripping a ribbon inserted in said tapered end, and said system further comprises: a case for holding said reel and having two side parts each disposed to be adjacent a respective reel flange part; and a holding device composed of a resilient sheet metal part presenting a contact surface which presses against the outer surface of that side part of said case which is adjacent the one flange part for resiliently holding the free end of the ribbon, in a clamping manner, under tension between said sheet metal part and said outer surface of that side part adjacent the one flange part, in a position such that the ribbon extends approximately diametrically across said

one flange part provided with the threading slit, whereby upon rotation of the takeup reel the ribbon is engaged by the catching edge and pulled out of said holding device into said threading slit.

3,935,940

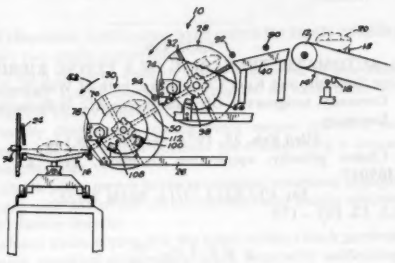
SORTER SYSTEM INDUCTION MEANS

Edward A. Wentz, Gaithersburg, and David M. Shinnick, Frederick, both of Md., assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Continuation-in-part of Ser. No. 331,205, Feb. 9, 1973, Pat. No. 3,871,511. This application Jan. 29, 1975, Ser. No. 545,199

Int. Cl.[2] B65G 47/57

U.S. Cl. 198—25 8 Claims



1. The combination comprising

an input conveyor,

a sorter conveyor having means along the path thereof for discharging articles from the conveyor to predetermined zones along the path of the conveyor,

and means for transferring articles from the input conveyor to the sorter conveyor comprising

first rotor means having a plurality of vanes defining article receiving pockets,

means for rotatably mounting said first rotor means between said input conveyor and said sorter conveyor about a generally horizontal axis parallel to a portion of the path of the sorter conveyor,

drive means operatively connected to said rotor means for intermittently rotating said first rotor means between successive indexed positions,

said successive indexed positions including a first position and a successive second position,

said first position being such that a vane of one pocket forms an inclined entrance ramp,

said second position being such that the adjacent vane of the same pocket defines an exit ramp,

second rotor means having a plurality of vanes defining article receiving pockets,

means for rotatably mounting said second rotor means between said first rotor means and said sorter conveyor about a generally horizontal axis parallel to a portion of said sorter conveyor and parallel to the axis of said motor means,

drive means operatively conneted to said second rotor means for intermittently rotating said second rotor means in the same direction as said first rotor means between successive indexed positions,

said second rotor means having vanes which successively cooperate with said receiving ramp to define a receiving pocket for an article transferred from said first rotor means,

said first position being such that a vane on one pocket is aligned with the exit ramp formed by the vane of said first pocket,

said second position of said second rotor means being such that the adjacent vane of the same pocket defines an exit ramp,

said drive means driving each said rotor means at a rate such that said vane forming an entrance ramp lifts an article being transferred from said first position to said second position and augments the gravitational movement of the article to said second position such that the article moves off of the vane that is acting as an exit ramp.

3,935,941

ADJUSTABLE BELT CONVEYOR

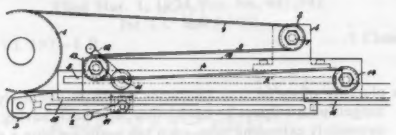
Jürgen Keck, Niefern-Oschelbronn, Germany, assignor to Gebrüder Bellmer KG, Niefern, Germany

Filed Sept. 4, 1973, Ser. No. 394,345

Claims priority, application Germany, Sept. 1, 1972, 2242993

Int. Cl.[2] B65G 15/16

U.S. Cl. 198—139 8 Claims



1. An adjustable belt conveyor assembly which is adapted for feeding flat workpieces to a forwardly and rearwardly adjustable position in a work station and especially for feeding box panels to the folding station of a box folding machine, the conveyor assembly comprising in combination:

an elongated stationary support structure which includes a guide profile defining a substantially horizontal conveying surface extending from a rearward point to a forward point on the assembly;

a first stationary belt roller arranged near the rear of the assembly;

a second stationary belt roller arranged near the front of the assembly;

a first intermediate loop roller arranged forward of said first stationary belt roller and having a smaller diameter than the latter;

a second intermediate loop roller arranged forward of the first intermediate loop roller, at a level below the second stationary belt roller;

an endless belt engaging said four rollers so as to form four consecutive belt strands as follows: an advancing bottom belt strand extending between the first belt roller and the second loop roller, at the lower side thereof and in parallel cooperative relationship with at least a portion of said conveying surface; a returning lower intermediate belt strand extending between the two loop rollers; an advancing upper intermediate belt strand extending between the first loop roller and the second stationary belt roller; and a returning top belt strand extending between the two stationary belt rollers; whereby said upper intermediate belt strand and said bottom belt strand are substantially parallel to one another;

means for driving the endless belt; and

means for simultaneously longitudinally adjusting the two intermediate loop rollers by equal increments, thereby lengthening or shortening said upper intermediate belt strand and correspondingly shortening or lengthening said bottom belt strand, the latter cooperating with the conveying surface of the stationary support to advance a workpiece therebetween to the adjusted position of the first intermediate loop roller; and wherein

the support structure further includes a rail profile having a longitudinal slot therein; and

the loop roller adjusting means includes an elongated support arm on which both intermediate loop rollers are

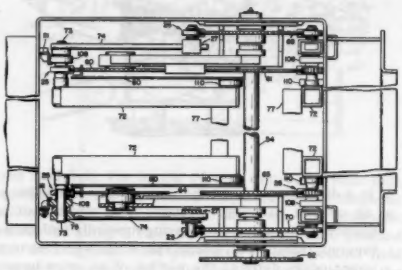
mounted at a fixed horizontal spacing, and support arm attaching means extending through said slot for clamping said support arm to said rail profile in any one of the plurality of longitudinal adjustment positions.

3,935,942

PACKAGE CONVEYOR METHOD AND APPARATUS

John W. Scott, Loma Linda, Calif., and Alan P. Hosie, Mississauga, Canada, assignors to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 448,178, March 4, 1974, abandoned.
This application May 22, 1975, Ser. No. 583,823
Int. Cl.² B65G 17/00
U.S. Cl. 198—157 9 Claims



1. A package conveyor comprising:
a casing;
a package carring, non-articulated, rigid tray;
a pair of spaced endless control chains mounted adjacent opposite walls of said casing;
a pair of spaced endless load chains mounted within said casing intermediate said endless control chains;
drive means, including chain sprocket members, interconnecting said control and load chains for rotating said chains in synchronism; and
means connecting said tray to points on said chains for maintaining said tray in substantially horizontal and vertical positions with respect to said chains during portions of tray travel while compensating for changes in spacing between the points during movement from one position to the other, one of said tray connecting means including means securing said tray to said chains for relative pivotal movement and the other of said tray connecting means including means securing said tray to said chains for relative pivotal and sliding movement.

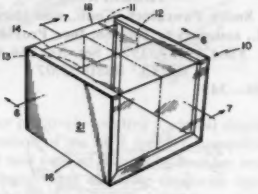
3,935,943

SEALED CARTON FORMED FROM A PAIR OF COOPERATING MEMBERS

Melvin H. Meyer, Maywood, Ill.; James L. Vickers, Harbert, Mich.; Edmund A. Waycie, River Forest, and Gerald Weitzel, Oak Lawn, both of Ill., assignors to Stone Container Corporation, Chicago, Ill.

Filed May 3, 1974, Ser. No. 466,731
Int. Cl.² B65D 25/00, 7/00
U.S. Cl. 206—45.34 8 Claims

8. A sealed carton containing lading and formed from a pair of cooperatively engaged members comprising, a pre-cut body blank member of foldable, structurally stable, load accommodating paperboard material and a cover sheet member formed of a flexible, very thin lightweight material capable of principally accommodating only tension stress in the plane thereof, said body blank having a pair of spaced apart lines of fold transverse to the longitudinal axis of the blank to provide a center panel and a pair of side panels hingedly connected along a pair of opposite side edges of the center panel, said body blank being folded into an upwardly opening generally U-shaped formation, each of said panels having hinged flanges along the opposite side edges thereof which are formed from the longitudinal edges of said body blank, the center panel flanges comprising end flanges, and said side panels additionally having outer transverse end edges with hinged flanges therealong, each flange being folded inwardly to a position normal to the plane of the respective panel to which it is hinged with the center panel flange ends abutting the contiguous side panel flange ends in cooperative supporting engagement, said lading being disposed on said center panel and having a configuration substantially filling said carton and supporting the side panels from the interior thereof, said cover sheet being folded into a downwardly opening U-shaped formation complementary to the first mentioned formation and matingly engaged tightly thereover, said cover sheet having its margin along opposite longitudinal edges coextensive with and adhesively secured in face-to-face overlying relation to those of said flanges which are connected to said side panels of said body blank to tie the side panels together in tension at their sides and across their transverse end edges, and the cover sheet also having its margin along its opposite end edges coextensive with and adhesively secured in face-to-face overlying relation to said end flanges of the center panel to dispose said flanges in supporting position between said side panels at the bottom ends thereof and to seal the lading in the thusly formed carton and retain the load accommodating body blank in the U-shaped formation.

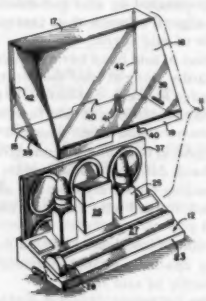


3,935,944

DIAGNOSTIC DISPLAY PACKAGE

John C. Wilson, Anaheim, and Robert Schiff, Mission Viejo, both of Calif., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed June 10, 1974, Ser. No. 477,563
Int. Cl.² B65D 1/36, 69/00, 85/00
U.S. Cl. 206—223 7 Claims



1. A display package comprising a rack, said rack having a front wall, two end walls, and a top wall, said top wall sloping downwardly from rear to front, said top wall having a plurality of wells, each of said wells adapted and constructed to carry at least a portion of a receptacle, one of said wells being an

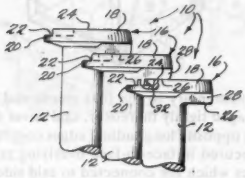
elongated trough means positioned downwardly and forwardly of the other said wells, said end wells of said rack extending rearwardly and each having therein a slot in oppositely disposed relationship adapted and constructed to carry a plate upright therebetween, a cover, said cover having a top wall, back wall and end walls, said cover having a front wall sloping downwardly from rear to front terminating in a skirt means overlying the front wall of said rack, the dimensions of said cover being such as to essentially surround said rack.

3,935,945

OPEN SIDED PARTIALLY CIRCULAR HEADED NAIL WITH RECESS ALONG THE OPEN-SIDED EDGE THEREOF AND STICK PACKAGE FORMED THEREFROM

George M. Smith, Pawcatuck, Conn., and Joseph Silva, Cranston, R.I., assignors to Textron, Inc., Providence, R.I.

Filed Apr. 9, 1975, Ser. No. 566,432
Int. Cl.² B65D *73/02*
U.S. Cl. 206—343 **5 Claims**



1. A nail including a shank provided by a length of metal strand material severed at one end from an end portion of a supply of such material and formed thereon with a workpiece entering configuration,

said shank having an integral enlargement on the opposite end portion thereof formed by surrounding the end portion with die means and impacting a mating plunger means longitudinally on the end surface thereof to cause the impacted material to cold flow in the die means, said enlargement defining a head configured to facilitate collation of said nail with similar nails in a row formation in which the shanks of adjacent nails are in abutting parallel relation and the heads of adjacent nails are in overlapping abutting relation,

said head extending radially outwardly from said shank substantially throughout the entire periphery thereof and terminating in a partially circular peripheral edge of greater than 180° generally arcuate about the axis of said shank interconnected by an open-sided peripheral edge disposed in aligned relation at its central portion with an adjacent side of said shank,

the upper portion of said head having a recess therein which extends inwardly along at least the central portion of said open-sided edge in overlying relation to the portion of the shank defining said adjacent side thereof,

the lower portion of said head bounded by said partially circular peripheral edge and extending radially outwardly from said shank defining a downwardly facing abutment surface extending outwardly from the adjacent periphery of said shank toward said partially circular peripheral edge,

the upper portion of said head having a top surface including a mating upwardly facing abutment surface area extending inwardly of said recess,

the radially outward extent of said downwardly facing abutment surface being greater than the radially inward extent of said recess.

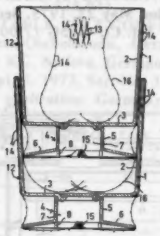
5. A nail as defined in claim **1** in combination with a plurality of similarly constructed nails disposed in an angularly extending row formation with adjacent nails of the row having their shanks in abutting parallel relation and the mating surface areas of the heads thereof in abutting relation, and means for securing said nails in said row formation.

3,935,946

MESH COVERED NESTED DISPLAY CONTAINERS

Willis Ray Bengert, 2983 Crescent Road, Pebble Beach, Calif. 93953

Filed May 18, 1972, Ser. No. 254,544
Int. Cl.² B65D *21/00, 33/02, 25/24*
U.S. Cl. 206—516 **3 Claims**



1. In a display container, the combination comprising:

a. an upright container, nestable with another of corresponding shape and size, having upwardly and outwardly tapered, transparent, lateral side walls, with free terminal upper edges defining the outline of an open upper end and a horizontal bottom wall closing the lower end of said container;

b. an elongated, tubular envelope of open work, flexible, resilient, thread-like mesh material open at one end and closed at its other end resiliently expandable radially thereof from a normally radially contracted untensioned, wrinkle-free condition substantially less than the diameter of said container, to an expanded, raidally tensioned, wrinkle-free condition at least equal to the maximum outside diameter of said container;

c. said envelope enclosing said container with its closed end extending horizontally below said bottom wall and the remaining portions thereof, in succession from said closed end of said envelope, extending in said radially evenly expanded, tensioned, condition over and yieldably against the outer surface of said lateral side walls and said upper free edges, and then downwardly into said container in a progressively contracted, but yieldably radially expandable, condition with said open end of said envelope terminating adjacent the bottom of said container, whereby said portion extending downwardly into said container will be radially expandable under the influence of another container of corresponding shape and size being nested within a container enclosed by said envelope.

3,935,947

MAGNETIC REFUSE SEPARATOR

William T. Barrett, Waukesha, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Feb. 20, 1974, Ser. No. 443,953
Int. Cl.² B07C *5/344*
U.S. Cl. 209—111.8 **14 Claims**

1. A magnetic separator comprising, in combination,

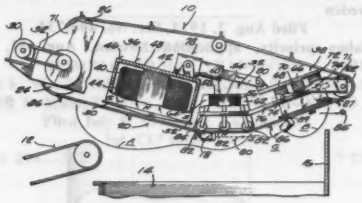
a belt,

means supporting said belt for movement around a closed path in continuous fashion, said path having upper and lower horizontal extensions,

a magnetic assembly supported adjacent said belt along a portion of the lower horizontal extension of said closed path to generate a magnetic field through which said belt moves,

means for moving said belt along said path,

and said magnetic assembly including a first magnetic field generating portion and a second magnetic field generating portion spaced a predetermined distance from said first field generating portion of the direction of the path of travel of said belt to provide a gap in the magnetic field generated by said magnetic assembly between said first and second field generating portions so that magnetic articles attracted to said belt in the area of said first field generating portion are released in said gap and fall away



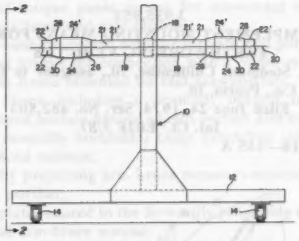
from said belt, the length of such gap being such that, together with the momentum imparted to said magnetic articles by the movement of said belt, said magnetic articles fall along a trajectory such that they are directed into the magnetic field generated by said second field generating portion and again attracted to said belt in the area of said second field generating portion and non-magnetics carried by said magnetic articles to said belt in the area of said first magnetic portion are dislodged in said gap and are thereby separated from said belt.

3,935,948

STORAGE RACK FOR UNVULCANIZED PNEUMATIC TIRES

James W. Podojil, Ravenna, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 29, 1974, Ser. No. 518,437
Int. Cl.² A47F 7/04
U.S. Cl. 211—23 **8 Claims**



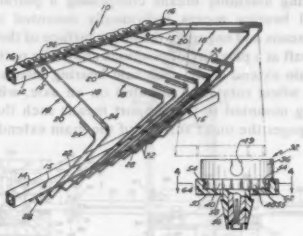
1. A rack for supporting an unvulcanized pneumatic tire said rack comprising a frame, a horizontally extending prong having a long axis and supported at one end on said frame, said prong having a first upper surface which is generally elliptical in cross-sectional configuration, a pair of second upper surfaces each with a generally elliptical cross-sectional configuration disposed on opposite sides of said first upper surface and at a lower elevation with respect to said first upper surface, and a tapered surface on axially opposite sides of said first upper surface forming smooth transitions between said first upper surface and said second upper surfaces, all of said upper surfaces being arranged in axial alignment with respect to said prongs.

3,935,949

POSITION LOCATING DEVICE FOR DISPLAY HANGER

Maurice Cohen, 3580 NW. 52nd St., Miami, Fla. 33142

Filed June 21, 1974, Ser. No. 481,898
Int. Cl.² A47F 5/12
U.S. Cl. 211—168 **8 Claims**



1. A device for positively locating a pivotal display hanger in a selected position of use on a support, comprising a base member fixed to said support, a locating member mounted on an end of said hanger and rotatable therewith upon pivotal movement of said hanger, means formed on said locating member cooperating with means formed on said base member to provide for step-by-step pivotal movement of said hanger, wherein said hanger is positively locatable in the selected position of use, the means as formed on one of said members including a generally circular recess, on a wall of which at least one projection is formed, the means as formed on the other member including an annular portion that is receivable in said recess for rotation therein, a plurality of teeth formed on said annular portion that engage the projection in said recess to provide for the step-by-step movement of said hanger, said base member being formed with the generally circular recess therein, and said locating member being formed with the annular portion thereon, said base member having a central opening formed therein, said locating member having a central opening formed therein that is aligned with the opening in the base member when said members are interfitted, the end of said hanger being defined by a vertical rod portion that is received in the aligned openings of said members, and a slot formed in said locating member for receiving a horizontal portion of said hanger for positively locating said locating member on said hanger and providing for rotating movement of said locating member upon pivotal movement of said hanger, said base member including a plate-like portion in which said recess is formed, and a plurality of resilient fingers joined to said plate-like portion on the underside thereof and extending into an opening formed in said support for locating said base member on said support.

3,935,950

INDUSTRIAL ROBOT

Arthur Robert Burch, Plainwell, Mich., assignor to Quality Steel Fabricators, Inc., Hopkins, Mich.

Filed Sept. 4, 1973, Ser. No. 393,790
Int. Cl.² B25J 9/00
U.S. Cl. 214—1 BB **17 Claims**

1. In an industrial robot for manipulating a work piece, wherein a tooling assembly means for handling the work piece is mounted on a moveable manipulator, an improvement wherein the manipulator comprises:

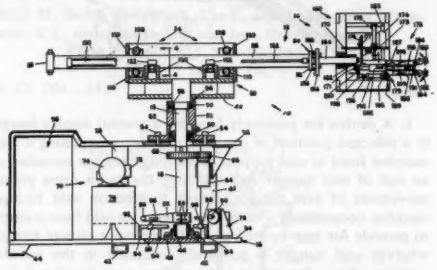
a base;

a main support shaft pivotably mounted on the base for rotation about a substantially vertical axis;

a non-circular main extend shaft having front and rear ends, with the front end comprising tool mounting means thereon for holding the tooling assembly means;

support means including a support frame mounted on the support shaft and a bearing assembly means mounted on the support frame, said bearing assembly means being

adapted to engage, support, and guide the main extend shaft for extension or retraction with respect to the support means in a generally horizontal, longitudinal direction, said bearing assembly means being further adapted to restrain the main extend shaft from vertical, lateral, or rotational movement with respect to the support frame, said bearing assembly means comprising a plurality of individual bearing means individually mounted in the support means and engaging the outer surface of the main extend shaft at a plurality of positions about the periphery of the main extend shaft, each said bearing means comprising a wheel rotatably mounted on an axle, with the axle being mounted in the support means such that the wheel engages the outer surface of the main extend shaft



and rotates about an axis perpendicular to the longitudinal direction of movement of the main extend shaft, each said axle being eccentrically mounted in the support means with respect to the axis of rotation of the wheel and being selectively rotatable with respect to the support means, said selective rotation of the axle with respect to the support means serving to effect a position adjustment of the wheel with respect to the main extend shaft so as to adjust for wear and misalignment of the main extend shaft and bearing means;

selectively operable drive means adapted to rotate the support shaft and extend and retract the main extend shaft; and

control means adapted to selectively operate the drive means.

3,935,951

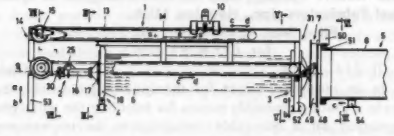
APPARATUS FOR PULLING AND REPLACING HEAT EXCHANGE TUBING

Ulrich Claus, Kolner Str. 128, 5908 Neunkirchen, and Dieter Dischmann, Erlenstrasse, 5908 Neunkirchen-Struthutten, both of Germany

Filed July 26, 1974, Ser. No. 492,977

Int. Cl.² B66F *1/00*

U.S. Cl. 214—1 P **3 Claims**



1. Apparatus for the placement and removal of a tube bundle of a heat exchanger, comprising a first frame, means carried by said first frame for pulling or inserting a tube bundle from or into the shell of said heat exchanger in a horizontal direction, means carried by the first frame for supporting opposite ends of a said tube bundle, a second frame pivotally secured to said first frame, means for releasably securing said pivotable frame to one end of the shell of a said heat exchanger, means to suspend said first frame from a lifting device, and means mounting said suspending means for movement relative to the first frame over most of the length of said first frame in said horizontal direction for continuously adjusting said means to suspend said first frame according to the change of center of gravity of the overall apparatus and the part of said tube bundle supported thereby when said tube bundle is being removed from, or inserted into, said shell of a heat exchanger.

3,935,952

FEED DEVICE FOR BULK MATERIAL

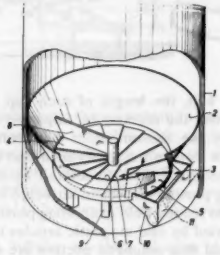
Kurt Albert Banner, Fargaregatan 6 A, Goteborg, Sverige, Sweden

Filed Aug. 2, 1974, Ser. No. 496,731

Claims priority, application Sweden, Aug. 31, 1973, 7311868

Int. Cl.² B65G *65/44*

U.S. Cl. 214—17 D **5 Claims**



1. Feed device for the bottom of a silo or other relatively large receptacles for bulk material, for example wooden chips, said feed device comprising driven means movable in a reciprocal substantially horizontal motion and having a number of steps, carrier elements in the form of risers of said steps and at least two feeding-out openings, said steps being defined by a circular line, in which the center of curvature substantially corresponds to the center of motion, and said steps leading downwards in opposite directions from at least one point at a highest level to at least two points at a lowest level, located at said feeding-out openings.

3,935,953

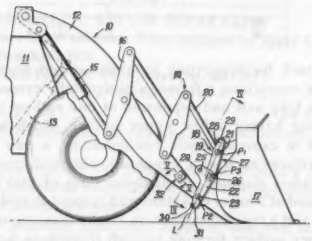
IMPLEMENT MOUNTING MEANS FOR EARTHWORKING VEHICLES

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 24, 1974, Ser. No. 482,503

Int. Cl.² E02F *3/81*

U.S. Cl. 214—145 A **12 Claims**



1. A vehicle adapted to have a work implement releasably attached thereon comprising

a frame,

implement support means, including lift arm means and tilt linkage means, mounted on said frame, and

mounting means, including at least one over-center toggle mechanism, mounted on said support means and interconnected between the lift arm means and tilt linkage means thereof for releasably attaching a work implement on said support means, said toggle mechanism comprising a pair of first and second links pivotally connected together at inner ends thereof at a common pivot means, an outer end of said first link being pivotally connected to said tilt linkage means and an outer end of said second link being pivotally mounted on said lift arm means.

3,935,954

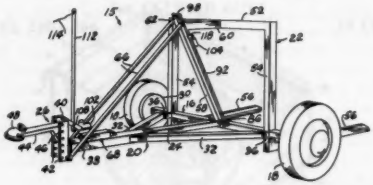
COMPACTED HAY TRANSPORT

Donald L. Woods; Kenneth G. Woods, and Ray A. Woods, all of 202 N. Main, Fairview, Okla. 73737

Filed July 8, 1974, Ser. No. 486,733

Int. Cl.[2] B60P *1/04*

U.S. Cl. 214—352 **7 Claims**



1. A self-loading bale transport, comprising:

a trailer having an axle portion journalling wheels;

tongue guide means pivotally connected with said axle portion,

said tongue guide means comprising a housing having an opening therethrough with the axis of the opening substantially normal to the longitudinal axis of said axle portion, and,

a pair of tongue braces projecting forwardly from said axle portion and connected with said housing,

said trailer having a sliding tongue slidably supported by said tongue guide means for movement toward and away from said axle portion;

hitch means connected with the forward end portion of said sliding tongue for connection with a prime mover;

a forklift frame mounted on said axle portion,

said frame including a normally upright inverted U-shaped portion having a bight portion and having a pair of normally horizontal tangs extending rearwardly in spaced relation;

forwardly projecting arm-brace means connected with said bight portion;

a latch plate secured to the forwardly projecting end portion of said arm-brace means;

at least one link extending between and connected at its respective ends with said arm-brace means and the forward end portion of said sliding tongue for vertical pivoting movement of said frame about the axis of said axle portion from a bale loading position to a bale transporting position in respone to sliding movement of said sliding tongue relative to said tongue guide means;

latch means connecting said frame with said sliding tongue and said tongue guide means; and,

remotely operated control means operatively connected with said wheels and said latch means for preventing rotation of said wheels during pivoting movement of said frame and releasing said latch means.

3,935,955

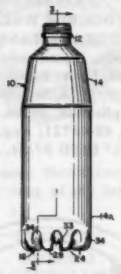
CONTAINER BOTTOM STRUCTURE

Salil K. Das, Hickory Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Feb. 13, 1975, Ser. No. 549,623

Int. Cl.[2] B65D *1/02*

U.S. Cl. 215—1 C **15 Claims**



1. In a container having a side wall, at least an end portion of the side wall being generally symmetrical about a central axis of the container, and a bottom structure closing the container at the side wall end portion, the outer surface of the bottom structure comprising a central concave dome portion, a convex annular rim portion circumscribing the dome portion and merging therewith and with the side wall end portion, and a plurality of radially oriented foot portions extending axially outwardly of the rim portion, each foot portion having lateral margins merging with the rim portion to form a rib portion between each pair of adjacent foot portions, the radial profile of each foot portion comprising a curve tangent to the radial profile of the dome portion and to the profile of the side wall end portion, the improvement comprising the feature that the foot portion curve comprises a plurality of tangential arcs in series, the radii of curvature of adjacent ones of the lastmentioned arcs being unequal.

3,935,956

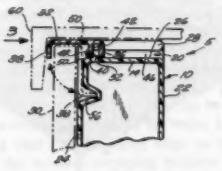
CONTAINER AND HANGER CLIP THEREFOR

Edward Sansanelli, Hasbrouck Heights, N.J., assignor to Airwick Industries, Inc., Teterboro, N.J.

Filed Oct. 2, 1974, Ser. No. 511,185

Int. Cl.[2] B65D *25/22*

U.S. Cl. 215—100 R **13 Claims**



1. An article of manufacture comprising, in combination, a hollow container having a support wall and a side wall extending angularly therefrom, a generally U-shaped clip having a bight portion and a pair of spaced legs; and means for pivotally mounting said clip on said support wall for movement between a storage position wherein the bight portion of the clip is adjacent and parallel to said side wall and a support position wherein the bight portion of the clip extends parallel to said support wall and at least part of said bight portion extends beyond the container for supportive engagement with a support member from which the container can be suspended; said

pivotal mounting means being operatively connected to the bight portion of said clip between the legs thereof whereby, in said support position of the clip, one of said legs is located in spaced relation to the container and the free end of the other of said legs is engaged with said support wall, thereby to provide a stop limiting pivotal movement of the clip.

3,935,957

INSULATION FOR DOUBLE WALLED CRYOGENIC STORAGE TANK

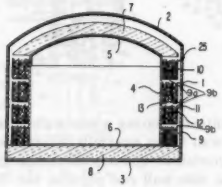
Tsutomu Hasegawa, Noda, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Apr. 9, 1974, Ser. No. 459,443

Claims priority, application Japan, Apr. 10, 1973, 48-40012; Apr. 24, 1973, 48-45721; Aug. 28, 1973, 48-95703

Int. Cl.² B65D *87/24, 25/18*

U.S. Cl. 220—9 LG **7 Claims**



1. In a cryogenic storage tank or the like comprising spaced, sealed inner and outer tank sidewalls with insulation between respective sidewalls, the improvement wherein: said sidewall insulation comprises thermal insulation material on the outer surface of the inner tank sidewall and a gaseous space between said outer tank sidewall and said insulating material, and means forming a blackish surface on said insulating material facing the spaced outer tank sidewall.

3,935,958

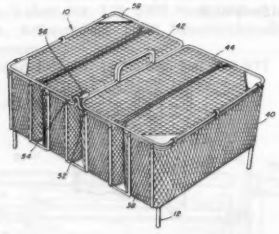
UTENSIL BASKET FOR INSTITUTIONAL DISHWASHING MACHINES

John W. Frangos, Beverly, Mass. 01915

Filed Dec. 17, 1973, Ser. No. 425,237

Int. Cl.² B65D *7/20*

U.S. Cl. 220—19 **6 Claims**



1. Apparatus for use in washing eating utensils and the like, comprising:

a. a foraminous basket formed with a plurality of adjacent compartments open to one side of said basket for receiving utensils selectively placed therein,

b. foraminous cover means connected to said basket for movement from a closed position across said compartments to an open position, and,

c. locking means for securing said cover means to said basket,

d. said basket being formed with a back wall and at least one side wall substantially perpendicular to one another whereby said basket may be placed on said back wall in a horizontal position for loading and unloading said compartments and in an upright position on said one side wall for washing,

e. said cover means including a pair of panels hinged to opposite sides of said basket, one of said panels being free to reciprocate over a limited distance, said one panel being formed with a lug and a lip at the free edge thereof,

f. a loop formed in said basket in position to be in adjacent registration with said lug when said one panel is closed, said lug being engageable with said loop by reciprocation of said one panel, said lip extending in front of said other panel to lock said other panel in closed position.

3,935,959

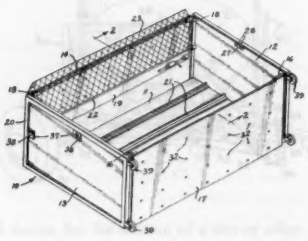
CONTAINER FOR BULK TOBACCO

William R. Long, Tarboro, N.C., assignor to Long Mfg. N. C., Inc., Tarboro, N.C.

Filed Jan. 31, 1975, Ser. No. 546,167

Int. Cl.² A24B *1/06*

U.S. Cl. 220—22 **15 Claims**



1. Container apparatus for receiving and supporting sheet-like articles comprising an elongated side wall, an end wall connected to each end of said side wall, first and second side panels swingably supported by said end walls in spaced relationship with said side wall, said side wall being selectively locatable in a first generally horizontal position and a second generally vertical position, said side panels being selectively located in a first position for closing the top and bottom of the container apparatus and a second position for closing the side of said container apparatus opposite said side wall, said articles being introduced in a randomly oriented manner generally parallel with said side wall when said side wall is in said first generally horizontal position, means for holding said articles in substantially fixed position when said panels are in side closing position, whereby said articles are introduced into said container apparatus in said first generally horizontal position and are retained in the same relative position when said container apparatus is moved to said second generally vertical position.

3,935,960

TAMPER INDICATOR TAPE

Lew W. Cornell, Mound, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

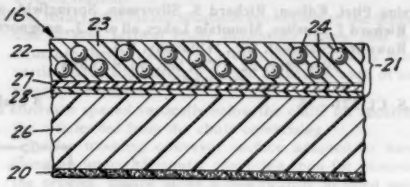
Division of Ser. No. 397,797, Sept. 17, 1973, Pat. No. 3,896,965. This application Jan. 30, 1975, Ser. No. 545,374

Int. Cl.² B65D *41/02, 41/00*

U.S. Cl. 220—260 **3 Claims**

1. An adhesive tape having particular utility in preparing a sealed container comprising in combination a sheet backing material to one face of which is firmly adherently bonded a smooth, uniform coating of normally tacky and pressure-sensitive adhesive and to the other face of which is firmly adhesively bonded an indicator layer comprising a strong flexible

binder matrix having a Young's modulus at 2% elongation of at least about 125,000 pounds per square inch, said binder



containing dispersed throughout, a solid, color-forming substance and capsules containing a liquid dye precursor reactable with said color-forming substance.

3,935,961

UNITARY BEVERAGE CONTAINER

Robert A. Bennett, 170 Sturbridge Road, Easton, Conn. 06484

Filed Sept. 30, 1974, Ser. No. 510,152

Int. Cl.² B65D *41/32*

U.S. Cl. 220—266 **15 Claims**

1. A unitary lid for a container having an open end, circular in cross-section, comprising:

A. a peripheral sidewall terminating with and extending downwardly and inwardly from the open end of said container;

B. a dome-shaped central portion, depressable from a first closed position to a second open position, terminating at its periphery with the peripheral sidewall, said portion incorporating:

1. at least one radially extending score line terminating at one end with said peripheral sidewall; and

2. at least one arcuate score line extending along a portion of the periphery of the central portion and substantially bisected by at least one radially extending score line;

whereby the lid closes the container when the dome-shaped portion is in the closed position and opens the container when said portion is depressed into said open position, thereby tearing the central portion along said score lines and thereby generating a pie-shaped orifice in the region of each radially extending score line.

3,935,962

CONTAINER

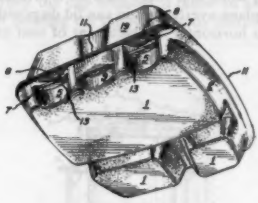
John C. Schubert; Steven Cyr, both of Chippewa Falls, and Charles B. Case, Eau Claire, all of Wis., assignors to Standard Oil Company, Chicago, Ill.

Filed Nov. 20, 1974, Ser. No. 525,390

Int. Cl. B65d *43/02*

U.S. Cl. 220—306 **15 Claims**

1. A deformable container comprising first and second members; wherein said first member has a protruding edge or lip; wherein said second member has a generally flat base and a sidewall which is outwardly inclined; and wherein said second member has at least one inwardly protuding surface, located on the outwardly inclined sidewall, having a void



space within which passes therethrough and is adapted to receive the protruding edge of the first member to effect a snap closure.

3,935,963

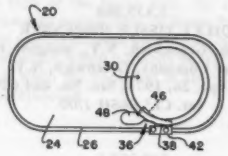
CAP LOCKING MEMBER

Elmer J. Knize, Chicago, Ill., assignor to Lippy Can Co., Ltd., Chicago, Ill.

Filed Feb. 24, 1975, Ser. No. 552,314

Int. Cl.² B65D *45/00;* **222** *153*

U.S. Cl. 220—315 **9 Claims**



1. A cap locking member for locking a cap or closure in a closed position relative to the neck or spout of the container, which neck or spout extends upwardly of the top wall of the container and with a rim extending around and upwardly of the top wall of the container and around the neck or spout, said cap locking member formed of a spring metal and having a portion engaging a portion of the rim and extending inwardly thereof in the direction of the neck or spout, said inwardly extending portion extending upwardly of the plane of the top wall of the container, said upwardly extending portion having a cap engaging edge, said cap engaging edge positioned contiguous to the bottom edge of the cap and engaging the underside of the bottom edge so that said cap engaging edge locks said cap against counterrotation, said cap locking member having a manually engageable portion adapted to be manually engaged by one hand and when sufficient downward pressure is applied thereagainst the cap engaging edge is depressed and disengaged from the underside of the cap to permit rotation of the cap in a counterdirection by the other hand, said spring metal returning said cap engaging edge to its predepressed position when the manual engaging portion is manually released.

3,935,964

TRASH CAN PROTECTOR

Van Rensselaer P. Saxe, 116 W. University Parkway, Baltimore, Md. 21210

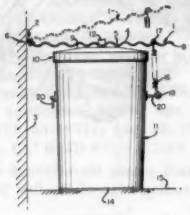
Filed Apr. 30, 1974, Ser. No. 465,680

Int. Cl.² B65D *45/00*

U.S. Cl. 220—318 **7 Claims**

1. A protector device for a can having a peripheral handle, including, a cover member pivotally secured to a relatively stationary support and movable to a substantially horizontal

plane engaging said can in an overlying manner, a can lid removably attached to the top of said can, said pivotally secured cover member provided with anchor means engaging said can lid only when said cover member is pivotally lowered to a horizontal plane overlying said can lid disposed upon said can to preclude horizontal displacement of said can lid, and



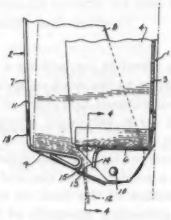
flexible clamping means carried by said cover member engageable with said can peripheral handle to prevent relative vertical displacement between said can, can lid and pivotally secured cover member and to retain said can and overlying can lid as an assembled unit in fixed proximity to said stationary support by means of said pivotal cover member.

3,935,965

TOILET TISSUE DISPENSER

Robert B. Stevens, Greenwich, N.Y., assignor to Stevens & Thompson Paper Company, Greenwich, N.Y.

Filed Apr. 26, 1974, Ser. No. 464,629
Int. Cl.² B65H *1/00*
U.S. Cl. 221—48 3 Claims



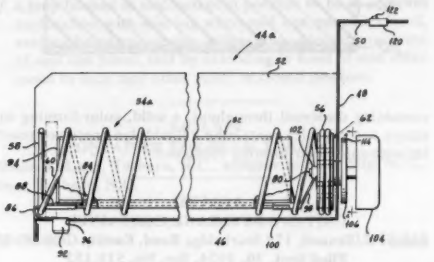
1. A dispenser for interfolded toilet tissue, a housing to contain the tissue and having a front surface, a bottom surface connected to the lower end of the front surface along a generally horizontal edge, and a pair of side surfaces connected to the side edges of the front surface and the bottom surface, said bottom surface having a slot extending in direction between said side surfaces and spaced rearwardly from said horizontal edge, said housing having a recess communicating with said slot and extending forwardly along the bottom surface to said horizontal edge and extending upwardly in said front surface, the portion of the recess in the bottom surface adjacent said horizontal edge having a substantially greater width than the width of said slot, the portion of the bottom surface disposed forwardly of the slot being located below the level of the portion of the bottom surface disposed to the rear of the slot, whereby the tissues supported on the bottom surface slop downwardly and forwardly, the edge of the bottom surface bordering the rear of the slot having a downwardly extending flange, and the edge of the bottom surface bordering the front of the slot being rounded and extending downwardly beneath the level of said flange, said interfolded tissue being dispensed by drawing the tissue downwardly from the slot and forwardly over the rounded edge of the bottom surface.

3,935,966

GUN AND MINT DELIVERY UNIT FOR HELICAL FEED MERCHANDISING MACHINE

Irving Pitel, Edison; Richard S. Silverman, Springfield, and Richard J. Mueller, Mountain Lakes, all of N.J., assignors to Rowe International, Inc., Whippany, N.J.

Filed Mar. 22, 1974, Ser. No. 453,886
Int. Cl.² G07F *11/36*
U.S. Cl. 221—75 8 Claims



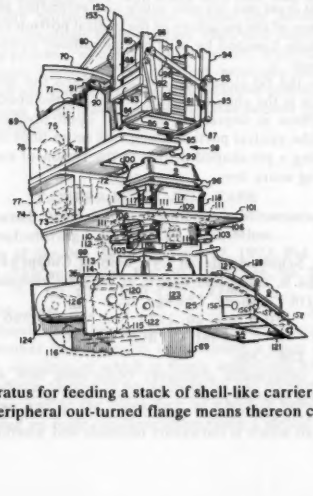
1. A delivery unit for feeding articles to the delivery area of a merchandising machine including in combination, a generally horizontally disposed shelf having a front edge, spaced side walls carried by said shelf, a helical delivery member formed with a plurality of turns, means rotatably mounting said delivery member between said side walls with said member extending from front to back of said shelf, an elongated article separator extending axially of said delivery member, said delivery member having a front terminus and a zero pitch portion for a predetermined angular extent from said terminus and a greater pitch portion disposed between said zero pitch portion and the remainder of said helical delivery member, said greater pitch portion forming a cam for delivering the leading article over the front edge of the shelf, and means for rotating said helical delivery member to deliver the leading article over the front edge of said shelf.

3,935,967

APPARATUS FOR FEEDING SHELL-LIKE ARTICLES

Eugene F. Doucette, Burlington, Mass., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 416,733, Nov. 19, 1973, Pat. No. 3,867,807. This application Aug. 28, 1974, Ser. No. 501,143
Int. Cl.² B65H *3/28*
U.S. Cl. 221—222 3 Claims



1. Apparatus for feeding a stack of shell-like carrier articles having a peripheral out-turned flange means thereon comprising

a vertical chute defined by plural vertical walls, the interior perimeter of said chute being slightly larger than the perimeter of the articles permitting vertical flow of the articles therein,

plural rotary feed means rotatably connected to the bottom end of said vertical chute depending below said wall structure thereof, said feed means being rotatable about vertical axes and having a helical means on each of said rotary feed means,

a conveyor spaced vertically below the chute for receiving the articles fed from the chute comprising

an endless traveling conveyor surface adapted to travel along an upper horizontal conveying span for receiving the articles, thence along a downwardly inclined span, around an end turn and along an underside return span, and

a stationary assembly gate means mounted adjacent the end turn, said gate means adapted to receive carrier articles and arrest their movement on the traveling surface for dispensing them singly upon demand from the gate by a positive force applied to the carrier separate from the conveyor,

the gate means comprising a downwardly inclined dead plate section terminating in a forward edge,

an overhead hold down guide,

means for yieldably pivotally mounting said guide in vertically spaced relation to said dead plate section,

said yieldable means normally positioning the guide for engaging carriers moving onto said dead plate and holding them thereon whereby the front of the carrier extends beyond said forward edge, and

said guide including an inclined segment extending longitudinally over at least a portion of said dead plate section and beyond its said forward edge, and an adjacent, normally horizontal terminal segment extending longitudinally and forwardly beyond said forward edge of the dead plate,

drive means,

means connecting the drive means to said plural rotary feed means for rotating the latter in unison in one direction of rotation for feeding articles one at a time from the stack in the chute, the helical means thereon positively guiding the articles from the lower end of the chute, and

means connecting the drive means to said conveyor for moving the latter past the lower end of said chute and toward said gate means,

the drive means operating the feed means and conveyor at a synchronous speed, whereby the carrier articles are fed vertically onto said conveyor in a line and moved by the conveyor onto said inclined dead plate of the gate means.

3,935,968

PACKING CONTAINER

Ruben A. Rausing, Rome, Italy, assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

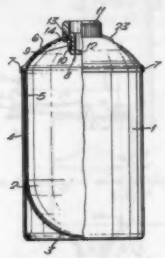
Filed June 14, 1974, Ser. No. 479,569

Claims priority, application Switzerland, June 20, 1973, 8960/73

Int. Cl.² B67D *3/00*; B65D *39/08*

U.S. Cl. 222—479 **2 Claims**

1. A packing container for liquids comprising a container composed of plastic material and provided with a convex upper portion forming a dome and an inwardly turned flange element surrounding a pouring opening in the top of the convex upper portion, and a cap member releasably secured in the pouring opening for closing said container, said cap member having an outwardly and radially extending offset portion for sealingly engaging the rim of the pouring opening at the top of the convex upper portion when said cap member is secured in the pouring opening, the improvement wherein said inwardly turned flange element is provided with a plurality of spaced passages arranged circumferentially around and extending through the upper portion of the inwardly turned flange element from the upper portion of the pouring opening radially inwardly of the rim thereof and downwardly and radially outwardly into the top portion of the container adjacent the top of the dome formed by the convex upper portion whereby when the cap member is removed and the container is tilted for pouring the liquid contents therefrom, the upper-



most passages permit the entrance of air into the container to permit even flow of the liquid from the container and the lowermost passages permit flow of liquid from the container into the liquid passing through the pouring opening and so that residual liquid which would normally be trapped in the convex upper portion when the container is almost empty will drain outwardly therethrough.

3,935,969

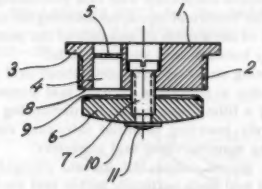
BUNG WITH SELECTABLE FLOW OPENINGS

Odd Thorbjörn Birkeland, Nedreveien 30, 4014 Vaulen, and Finn Graaner, Harriet Backers vei 5, 4000 Stavanger, both of Norway

Filed Sept. 13, 1972, Ser. No. 288,537

Int. Cl.² B65D *47/10*

U.S. Cl. 222—541 **4 Claims**



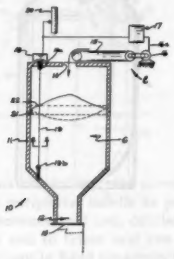
1. A bung for containers comprising an externally screw-threaded body having a plurality of flow openings therethrough arranged in a series about the axis of the bung, a valve for simultaneously opening and closing all of the flow openings, a thin penetrable closure closing each flow opening and being so disposed that the closure of any opening can be penetrated without penetrating the closure of any other opening, and a valve operator lying on the axis of said body and movable relative to said body to move said valve to open and close said flow openings, said flow openings surrounding said valve operator.

3,935,970

AUTOMATIC LEVEL MEASURING AND CONTROL SYSTEM FOR DISPENSING BIN

Robert L. Spaw, 858 E. Little York Road, Houston, Tex. 77022

Division of Ser. No. 158,883, July 1, 1971, Pat. No. 3,807,231.
This application Feb. 4, 1974, Ser. No. 439,056
Int. Cl.[2] B67D 5/08
U.S. Cl. 222—56 15 Claims



1. A measuring system for automatically measuring a variable quality or quantity of matter present within a sensing area and for providing a representation of the value of said quality or quantity, comprising:

a. sensing means including an elongate body of metallic material having first and second end means with said body extending between spaced points in said sensing area;

b. energizing means connected with said sensing means for electrically energizing said body;

c. electrical processing means connected with said sensing means and responsive to a change in one or more electrical characteristics of said body which vary in value as a function of the quality or quantity of the matter adjacent said body between said spaced points and for forming an output electrical signal dependent upon the value of said one or more electrical characteristics;

d. output means connected with said processing means and said output electrical signal for forming an output representative of the quality or quantity of the matter adjacent said body between said spaced points;

e. an enclosing structure extending about said sensing area for forming a container means, said container means including a filling opening and a dispensing opening for respectively inserting material into said container and dispensing material from said container;

f. securing means connected to said elongate body for mounting said body vertically within said enclosing structure, said securing means including first and second vertically spaced mounting members positioned substantially at the upper and lower ends of said container means with said elongate body connected to and extending linearly between said mounting members in touching engagement with matter contained within said container;

g. control means connected with and operated by said output means for automatically inserting material into said container to maintain a predetermined quantity of material said container; and

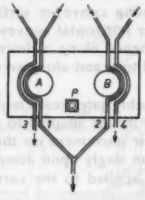
h. digitizing means included in said processing means for converting said difference signal into a square wave digitized signal having pulses of constant amplitude and width and a frequency which is a function of said difference signal frequency.

3,935,971

DOUBLE PUMP DEVICE FOR MIXING TWO OR MORE LIQUIDS WITH VARIABLE RELATIVE RATIOS AND CONCENTRATIONS

Paolo Papoff; Dante Guidarini, both of Bari, and Carlo Fragale, Cosenza, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed May 23, 1974, Ser. No. 472,848
Claims priority, application Italy, May 30, 1973, 73/50345
Int. Cl.[2] B67D 5/60
U.S. Cl. 222—134 6 Claims



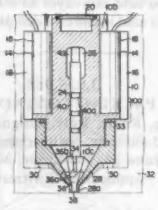
1. A double pump device for mixing with variable ratios and concentrations two or more liquids, comprising in combination: a first peristaltic pump, and a second peristaltic pump, each of said pumps acting on a plurality of collapsible tubes, some of said tubes having a crosssectional area different from others of said tubes, said pumps being operated by two electric motors, driven by an electronic circuit comprising as main elements a differential amplifier and circuitry means for adjusting the input voltage of the differential amplifier and for amplifying the output signals from the differential amplifier before their application to the two driving motors so that the speeds of the motors vary inversely to each other.

3,935,972

PRESSURE ACTUATED NOZZLE VALVE FOR INJECTION MOLDING UNITS

Shiro Tsunemoto, Edosaki; Eiichi Hirayama, and Teruki Mizuguchi, both of Azuma, all of Japan, assignors to Fuji Plastic Co., Ltd., Japan

Filed Dec. 27, 1974, Ser. No. 536,863
Claims priority, application Japan, Dec. 28, 1973, 49-852
Int. Cl.[2] B29F 1/03
U.S. Cl. 222—146 HE 8 Claims



1. An injection unit for a hot runner molding comprising a heating cylinder having plastic passageways formed therethrough in the longitudinal direction, a torpedo member having a central blind hole formed therethrough in a manner spaced from and parallel with said plastic passageways of the cylinder and disposed fixed within the cylinder, nozzle means attached to one end of said cylinder at the opening side of the central blind hole of the torpedo member and provided with an injection nozzle communicating with the plastic passageways of the cylinder, said heating cylinder having elastically wide operable blind heater holding holes bored at the other cylinder end in a manner substantially equiangularly spaced

from one another, valve means having a slidable pin member disposed within the central hole of the torpedo and a valve member connected to the pin member and disposed within the nozzle means, and resilient biasing means so disposed within the central hole of the torpedo as to bias the pin member thereby causing the injection nozzle of the nozzle means to be closed by the valve member.

3,935,973

AEROSOL SPRAY CONFINING DEVICE

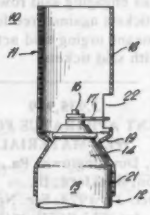
Hendrik Frans Weyn, Le Chesnay, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,511

Claims priority, application France, Dec. 19, 1973, 73.45479

Int. Cl.² B67D *5/06*; **B05B** *1/28, 15/04*

U.S. Cl. 222—182 **7 Claims**



1. In combination, an aerosol container having a peripheral wall and an axially directed discharge nozzle and a valve actuating element comprising a lever extending radially from said valve at a common end of said container, said nozzle communicating with the bottom interior of said container through a normally closed valve and tube and a tubular shield supported by and extending coaxially from said container and separably coupled thereto and communicating at its proximate end with said nozzle, and having a discharge opening at its distal end of diameter approximately equal to or slightly greater than that of said container peripheral wall, said valve actuating element being accessible for finger operation by means of an opening formed in the lower part of said shield.

3,935,974

AEROSOL DISPENSING DEVICE WITH VENTURI

Hendrik Frans Weyn, Le Chesnay, France, assignor to Colgate-Palmolive Company, New York, N.Y.

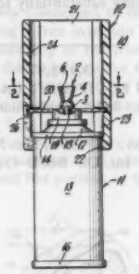
Filed Nov. 18, 1974, Ser. No. 524,517

Claims priority, application France, Dec. 19, 1973, 73.45488

Int. Cl.² B65D *83/00, 83/06, 83/14*; **B05B** *1/28*

U.S. Cl. 222—402.13 **7 Claims**

1. A spray device comprising an aerosol container including a normally closed valve and an axially directed discharge tube and an actuator coupled to said valve and movable between a valve open and a valve closed position, a tubular sleeve axially slideably engaging said container and projecting above the top thereof and terminating at its distal end in an opening a spray expanding nozzle having a venturi shaped bore coaxial and communicating with said discharge tube, means coupling said sleeve to said actuator whereby depression of said sleeve operates said actuator to open said valve, said sleeve being axially movable between a raised extended position projecting above said container and a lowered contracted position telescoped by said container and including an actuator member transversely outwardly directed from said valve actuator, said coupling means comprising an actuator depressor section located on and movable with said sleeve between a raised position with the extended position of said sleeve to release said actuator member to its valve open position and a depressed position urging said actuator member to a valve open position with the depression of said sleeve below its extended position.



3,935,975

CONTAINERS

John Harry Gauntlett, Mayfield 7 Kingsdene, Tadworth, United Kingdom

Continuation of Ser. No. 107,286, Jan. 18, 1971, abandoned. This application July 26, 1973, Ser. No. 382,735

Claims priority, application United Kingdom, Jan. 9, 1970 2403/70; May 13, 1970 2304/70; June 11, 1970 28330/70.

Int. Cl.² B65D *37/00*

U.S. Cl. 222—490 **10 Claims**

1. A closure for a sealed fluid container comprising:

an elastically resilient container wall;

an opening in said container wall;

an elastically resilient flap member having a sealing surface and resiliency for acting to cause said surface to normally lie in intimate overlapping sealing contact with said container wall so as to close said opening; and

a portion of said container wall immediately around said opening being capable of distortion to cause said sealing surface of said flap member to move away from said container wall to allow fluid to pass through said opening.

3,935,976

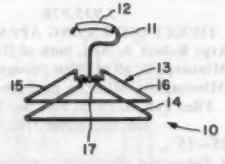
MULTIPLE GARMENT HANGER

Murray Mizrach, 860 United Nations Plaza, New York, N.Y. 10017

Filed May 29, 1973, Ser. No. 364,498

Int. Cl.² A47J *51/084*

U.S. Cl. 223—88 **7 Claims**



1. A garment support device comprising generally similar first and second generally triangular-shaped hangers which are each formed of a strand of wire and which, when the device is upright, define generally parallel and vertical planes, each hanger having one side as a generally horizontal bottom edge and opposite this edge a top neck where the remaining two sides of the triangle coverge, coupling means extending laterally between and separating said necks a predetermined distance and permanently joining said necks in a pivotal relationship about a pivot axis generally parallel to said bottom edges, and a handle having a top part formed as a hook and a bottom part that is engaged to said coupling means and is pivotal

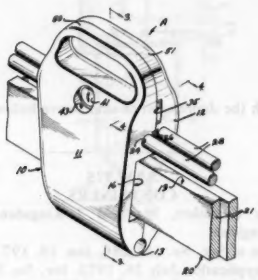
about said pivot axis, said necks and said couling means establishing, when said device is upright, a predetermined elevation with said handle being substantially totally above said elevation.

3,935,977

SKI EQUIPMENT CARRIER

Robert B. Bonnett, 8618 Robinwood Circle, Utica, Mich. 48087

Filed Nov. 13, 1974, Ser. No. 523,648
Int. Cl.² B65D *45/04*
U.S. Cl. 224—45 S 11 Claims



1. A ski equipment securing and carrying device including a body portion having a pair of polygonal cover segments, each of said cover segments having a ski receiving portion and a pole receiving portion, each said ski receiving portion being shaped to receive a ski therewithin and each said pole receiving portion being shaped to receive a ski pole therewithin, each said ski receiving portion and said pole receiving portion including yieldable members for respectively engaging a ski and a ski pole, hinge means hingedly interconnecting said cover segments for juxtaposed closure thereof with said ski receiving portion and pole receiving portion of one of said cover segments confronting the ski receiving portion and pole receiving portion of the other of said cover segments in cooperative relationship for respective clamped engagement by said yieldable members of a ski and a ski pole in relatively fixed position within each said ski receiving portion and said pole receiving portion thereof, and latch means for securing said cover segments in a juxtaposed closed relationship, said latch means comprising tab means positioned interiorly within one of said cover segments and tab means receiving aperture means opening interiorly of the other of said cover segments.

3,935,978

TICKET DISPENSING APPARATUS

Ewald A. Arp; Robert A. Arp, both of Hopkins, and Gene S. Moody, Minneapolis, all of Minn., assignors to Arnold W. G. Larson, Minneapolis, Minn., a part interest

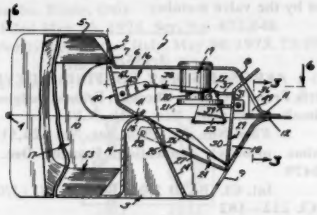
Filed Feb. 3, 1975, Ser. No. 546,504
Int. Cl.² B26F *3/02*
U.S. Cl. 225—15 12 Claims

1. Ticket dispensing apparatus comprising:

a. a housing defining a supply chamber for a folded elongated row of tickets connected together in edge-to-edge relationship, and a dispensing chamber communicating with said supply chamber and defining a discharge opening;

b. a ticket feeding element mounted in said dispensing chamber for movement in one direction to feed tickets toward said discharge opening and alternately in an opposite retracting direction out of operative engagement with said tickets;

c. an actuator mounted in the housing for movement in one direction toward a feeding position to engage said feeding element and impart ticket feeding movement thereto, and in the opposite direction to a ticket holding position in engagement with said row of tickets to hold the same against feeding movement when said feeding element is retracted;



d. retarding means engaging said row of tickets to frictionally hold said tickets against free feeding movement;

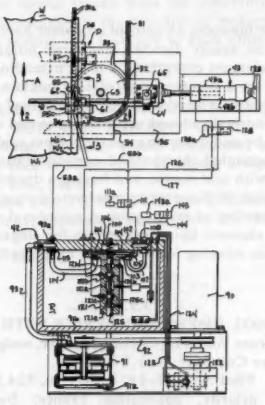
e. and yielding means urging said actuator toward holding engagement with said tickets.

3,935,979

WEB ALIGNMENT APPARATUS FOR MULTI-LEVEL WEB MATERIAL

Thomas L. Hickey, Downingtown, Pa., assignor to Rockford Servo Corporation, Rockford, Ill.

Filed Oct. 21, 1974, Ser. No. 516,757
Int. Cl.² B65H *25/26*
U.S. Cl. 226—19 16 Claims



1. A web alignment apparatus for use with tufted webs and the like having a backing and a pile on the backing inwardly of the edge of the latter to maintain the pile edge in a preselected lateral position relative to a device which operates on the web, said web alignment apparatus including a gap-type pneumatic sensor having a sensing orifice at one side of the gap and a transmitting orifice at the other side of the gap for transmitting a stream of air toward the sensing orifice, vane means extending into the gap to variably interrupt the stream of air and thereby vary the pneumatic signal at the sensing orifice, a web engaging member adapted to engage the pile edge, means mounting said web engaging member for movement in a first path crosswise of the course of travel of the pile edge and generally parallel to the plane of the web to sense lateral deviations of the course of travel of the pile edge from said preselected lateral position and in a second path transverse to the plane of the web at the sensing location to sense if the web engaging member rides onto the pile, means opera-

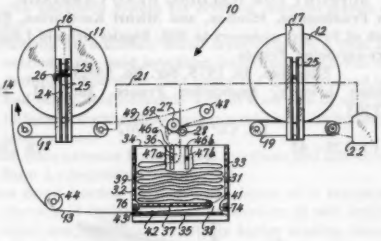
tively connecting said web engaging member to said vane means for moving the latter in the gap to variably interrupt the stream of air from the transmitting orifice in response to movement of the web engaging member along either said first or said second path, and power means responsive to variations in pressure at said sensing orifice produced by movement of said vane means crosswise of said stream of air for effecting relative shifting of said web and the device which operates on the web to maintain the pile edge in the preselected lateral position relative to the device which operates on the web.

3,935,980

CONTINUOUS TAPE PAYING APPARATUS

James E. Groat; Stanley C. Hobson, both of Orange, Calif., and Lawrence B. Woolman, Marion, Ind., assignors to The Anaconda Company

Filed Mar. 4, 1974, Ser. No. 448,087
Int. Cl.² B65H 17/42
U.S. Cl. 226—43 **9 Claims**



1. An accumulator, for use in the continuous paying out of tape, comprising:

A. an upright rectangular chamber comprising two parallel side walls defining a width to said chamber slightly exceeding the width of said tape, forward and rearward end walls joining said side walls, and a horizontal partition defining a bottom passageway for said tape, said partition being spaced from said rearward end wall,

B. drive means continuously introducing said tape into the top of said chamber approximately midway between said end walls and movable for producing folds in the tape such that the tape is storable in said chamber in an accordion fashion,

C. arcuate guide means for said tape, said guide means being mounted between said rearward end wall and said partition, and

D. an opening in said forward end wall communicating with said passageway for continuously paying out said tape.

3,935,981

SURGICAL APPARATUS FOR SUTURING ORGANS AND TISSUES WITH METAL STAPLES

Ernest Mikhailovich Akopov, Dubninskaya ulitsa, 61, kv. 88; Nikolai Nikolaevich Kapitanov, 8 ulitsa Oktyabrskogo polya, 5, kv. 9; Alexei Alexeevich Strekopytov, ulitsa Vsevoloda Vishnevskogo, 10, kv. 67; Evgenia Sergeevna Ogoltsova, Rogozhsky val, 13, korpus 3, kv. 14, and Alexandr Ilich Paches, Ulitsa Medvedeva, 12/6, Kv. 5, all of Moscow, U.S.S.R.

Filed June 5, 1974, Ser. No. 476,559
Claims priority, application U.S.S.R., July 31, 1973, 1955101
Int. Cl.² B25C 5/02
U.S. Cl. 227—19 **6 Claims**

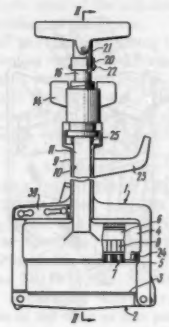
1. A surgical apparatus for suturing organs and tissues with metal staples, comprising, in combination:

a. a frame having an opening and including a pair of parts;

b. a clamp member mounted on one of the parts of said frame and releasably connected to the other part of the frame for permitting a free insertion of the organ being sutured into said opening of the frame after the clamp member has been displaced relative to the other part of the frame;

c. said clamp member including a flat portion having recess means for bending legs of staples;

d. a staple head mounted on the frame and including means for guiding the staple head in a path of perpendicular travel relative to said flat portion of the clamp member;



e. a drive connected to said staple head for causing its travel;

f. a holder on said frame spaced from said clamp member for metal staples inserted into the staple head, whereby tissues being sutured can be arranged between the clamp member and the holder;

g. a pusher for staples mounted on said frame for perpendicular travel relative to said clamp member for pushing staples from the holder, through the tissues and into engagement with the recess means of the flat portion of the clamp member; and

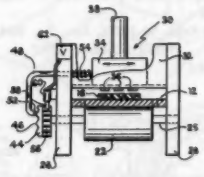
h. a drive on the frame connected to said pusher for operating the pusher in relation to the clamping member.

3,935,982

WIRE INSERTING APPARATUS FOR TIRE TREADS

James K. Neuschel, 5 Park St., Richfield Springs, N.Y. 13439

Filed Feb. 21, 1975, Ser. No. 551,777
Int. Cl.² B27F 7/14
U.S. Cl. 227—101 **8 Claims**



5. An apparatus for inserting wire elements in tread rubber having a tread design, a bench for supporting the tread rubber, drive rollers for advancing the tread rubber longitudinally along the bench, means spaced above the bench for driving the wire elements into the tread rubber as it advances, said last-named means including a carriage movable in guideways disposed at right angles to the direction of travel of the tread rubber, means to move the carriage in a predetermined pattern in the guideways whereby the insertion of the wire ele-

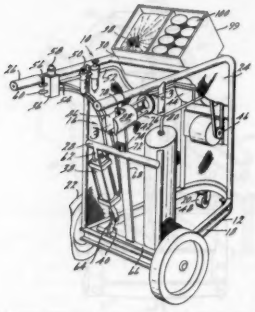
ments can be coordinated with the tread design, and means cooperable with one of the drive rollers for controlling the spacing of the elements.

3,935,983

ROOF NAILING MACHINE

Albert T. Buttriss, Fairview Park, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 22, 1974, Ser. No. 516,921
Int. Cl.² B27F 7/02
U.S. Cl. 227—110 14 Claims



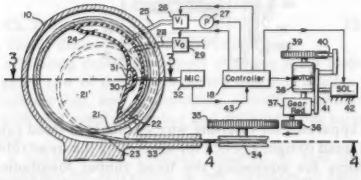
1. A nailing machine comprising:
a wheeled carriage adapted for movement on a surface to be nailed,
a frame mounted on said carriage,
force transmitting means including a stroking member,
means mounting said force transmitting means on said frame for movement of said stroking member through a nailing stroke,
a nail driver, and
means interconnecting said stroking member and said nail driver and including lost motion means operative to allow inertial movement of said nail driver from a rest position adjacent said stroking member to a working position remote from said stroking member in response to movement of said stroking member through its nailing stroke.

3,935,984

AUTOMATIC CUFF MECHANISM FOR BLOOD PRESSURE MEASURING SYSTEM

Abraham Lichowsky, Los Angeles, and Jack I. Bauman, Santa Monica, both of Calif., assignors to Ambitex Company and Medical Monitors, Inc., both of Los Angeles, Calif., part interest to each

Filed Sept. 9, 1974, Ser. No. 504,131
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 C 5 Claims



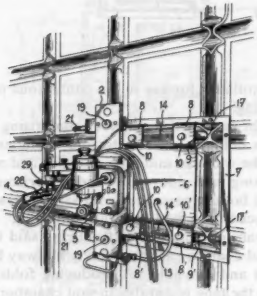
1. An automatic cuff mechanism for use with a blood pressure measuring system, comprising, in combination:
a. an enclosing member defining an opening for receiving a portion of a person's body in which blood circulation is to be temporarily cut off;
b. mechanical contracting means including a flexible band having one end secured to an inner wall portion of said opening in said enclosing member, said band passing circumferentially about the interior of said opening; and pulling means secured to said band and passing tangentially therefrom out said enclosing member such that a pulling force on said pulling means circumferentially contracts said band in a manner of a tightening spiral to close about said portion;
c. means responsive to a given resistance force exerted by said portion resisting further contraction of said contracting means to terminate operation thereof so that said contracting means engages about said portion in a snug manner; and
d. a flexible fluid chamber lying along a portion of the interior surface of said band, in a position between said flexible band and said portion of a person's body such that further pressure can be exerted on said portion by filling said flexible fluid chamber with fluid.

3,935,985

SUPPORT FOR WELDING HEAD CARRIAGE

Alain Prudhomme, Meudon, and Michel Kotcharian, Paris, both of France, assignors to BSL Bignier Schmid Laurent, Ivry-sur-Seine, France

Filed Jan. 30, 1975, Ser. No. 545,536
Claims priority, application France, Jan. 31, 1974, 74.03203
Int. Cl.² B23K 37/02
U.S. Cl. 228—45 16 Claims



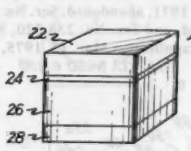
1. A support for the carriage of a welding head for the automatic welding of metal plates comprising
corrugated elements disposed in two peripendicular directions so as to intersect each other,
abutment surfaces at the ends of said corrugated elements at their intersections,
planar members surrounded by said corrugated elements and disposed between the intersections thereof,
a base adapted to be removably fixed to one of the planar members,
means for centering the base with respect to the corrugations surrounding the planar members by contact with a plurality of said abutment surfaces,
means defining the distance from the base to the planar member by contact with a plurality of said corrugations,
means for mounting a guide bar on said base parallel to at least one of said corrugations whereby the guide bar may receive the carriage in a translational manner, and
suction means for removably fixing the base to one of the planar members.

3,935,986

SOLID STATE BONDING PROCESS EMPLOYING THE ISOTHERMAL SOLIDIFICATION OF A LIQUID INTERFACE

Pasquale R. Lattari, Attleboro, and Carl Redfield, North Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 3, 1975, Ser. No. 554,383
Int. Cl.² B23K *28/02*
U.S. Cl. 228—115 **6 Claims**



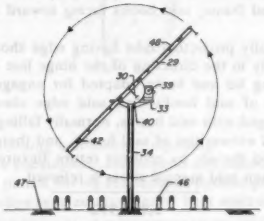
1. An improved system for bonding selected metals comprising:
arranging an interliner metal layer between a first and a second layer, said interliner layer having a lower initial melting temperature than either the first or second layers and being heat diffusible with at least one of said layers to form a ductile alloy having a relatively higher melting temperature.
solid state pressure bonding said interliner and said layers to form a composite material, and
post bond heating of said metal layers at a temperature above said initial melting temperature of said interliner layer and below said relatively higher melting temperature of said alloy for sufficient time to melt said interliner and initiate diffusion of said intermediate layer meterial with at least said one of the two layers to form a layer of said new alloy of higher melting point and to solidify said new alloy layer for securely bonding said first and second layers of metal together.

3,935,987

METHOD FOR ROTATION OF PLATES TO FACILITATE WELDMENT

Christopher J. Foster, Sr., and Christopher J. Foster, Jr., both of 14 Vanderventer Ave., Port Washington, N.Y. 11050

Division of Ser. No. 324,445, Jan. 17, 1973, Pat. No. 3,827,682. This application Oct. 5, 1973, Ser. No. 404,130
Int. Cl.² B23K *37/04, 31/02*
U.S. Cl. 228—213 **8 Claims**



1. A method of facilitating the weldment of adjoining plates comprising:
locating a supporting frame structure intermediate an in line production conveying system for weldment and handling of plates in shipbuilding procedures;
providing conveying means positioned with respect to the supporting frame and extending upwardly therefrom so as to engage with the plates and in coordination and alignment with the in-line conveying system and to facilitate positioning and removal of the plates with respect to the frame during material handling activities;
conveying the plates onto the supporting frame structure in an inoperative position;
securing the plates on the supporting frame structure;
partially welding the plates together;
shifting the frame and secured plates to an operative position free of the conveying means;
rotating the frame and secured plates to a second welding position by controlled rotation of the frame and secured plates between a substantially horizontal normal first welding position and a second welding position sufficiently removed from the first welding position to facilitate access to both sides of the adjoining plates;
completing the welding of the plates;
shifting the frame and secured plates to the inoperative position and bringing the secured plates into engagement with the conveying means; and
conveying the plates in the second welding position from the frame by means of the conveying means in alignment and in coordination with the in-line conveying system.

3,935,988

PROCESS OF PRODUCING SOLDERABLE COMPOSITES CONTAINING AGCDO

Ulf O. Harmsen, Pforzheim, and Wolfgang S. Pottken, Keltern-Dietlingen, both of Germany, assignors to Eugen Durrwachter Doduco, Pforzheim, Germany

Filed June 24, 1974, Ser. No. 482,071
Claims priority, application Germany, July 5, 1973, 2334160. The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.
Int. Cl.² C22F *1/14;* **B23K** *1/04*
U.S. Cl. 228—252 **1 Claim**

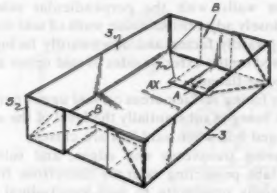
1. A process of manufacturing a solderable composite body containing silver cadmium oxide comprising the steps of forming an assembly having an intermediate layer of a silver copper alloy located between and in contact with a layer of a silver cadmium alloy and a layer of silver or silver alloy, welding the layers together, and subsequently internally oxidizing the cadmium, wherein the welding step comprises heating the assembly until the occurrence of a pasty $S + \alpha$ phase of the silver-copper alloy.

3,935,989

FOLDABLE CARTON TRAY

Kenneth Naylor, Bradford, England, assignor to Alf Cooke Limited, England

Filed Dec. 28, 1973, Ser. No. 429,081
Int. Cl. B65d *5/24*
U.S. Cl. 229—31 R **2 Claims**



1. A carton tray blank of cardboard or like sheet material which is formed with longitudinal and lateral fold lines parallel to the boundaries of the blank to delineate respectively side and end panels connected by corner panels and all surrounding a center panel, each end panel having diagonal fold lines extending from the adjacent intersections of said longitudinal and lateral fold lines towards but stopping short of the edge of said panel to delineate a first trapezoidal flap with a tongue extension formed by cuts extending from said diagonal fold lines to said edge, the center panel having three cut lines near each end to delineate at each end a

second trapezoidal flap having a common base with said first flap and being complementary to the latter, the blank being erectable by folding the side panels up at 90° to the center panel, then at each end downwardly folding said first flap at 90° to the center panel so that the adjacent corner panels swing around to the carton's end, swinging said second flaps up into the vertical position to abut the corner panels whereby the end walls are formed, and folding said first flaps further to cause them to occupy the spaces vacated by the second flaps, with the tongue extension overlapping the center panel and locking the first flaps in positions providing a complete bottom for the carton.

3,935,990

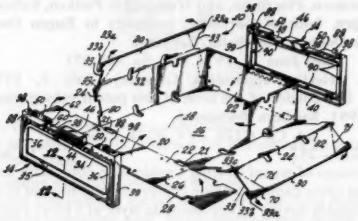
PLASTIC REINFORCED PRODUCE CONTAINER

Walton B. Crane, Sherman Oaks, Calif., assignor to A & E Plastik Pak Co., Inc., City of Industry, Calif.

Division of Ser. No. 307,962, Nov. 20, 1972, Pat. No. 3,878,980, which is a continuation-in-part of Ser. No. 193,874, Oct. 29, 1971, abandoned, Ser. No. 227,798, Feb. 22, 1972, abandoned, and Ser. No. 238,320, March 27, 1972, abandoned. This application Mar. 17, 1975, Ser. No. 559,064

Int. Cl.² B65D *61/00*

U.S. Cl. 229—34 R **3 Claims**



1. In a generally rectangular container with rigid rectangular, reinforcing end frames at opposite ends thereof, the container having rectangular bottom, opposed side and end walls, and lids which are respectively hinged along longitudinal edges thereof to the upper edges of said opposed side walls, said lids having opposite longitudinal swinging edges, said rectangular end frames comprising integral, coplanar, upper, lower and side flanges parallel with the end walls of the container and lying thereadjacent, and rectangular integral upper, lower and side flanges, integral with and projecting perpendicularly from said coplanar flanges from the outer margins thereof, whereby to provide reinforcing caps receiving therein the corresponding end walls of the container and end portions of said bottom walls, with the perpendicular side flanges thereof lying closely adjacent said side walls of said container:

horizontal upwardly facing and downwardly facing surface areas formed on the exterior sides of said upper and lower perpendicular flanges,

the upwardly facing surface areas on said upper perpendicular flanges being at substantially the level of the underside of the hinged lids when said lids are closed,

said lids having transverse end edges, and substantially coplanar tabs projecting laterally therefrom from positions generally proximate to said longitudinal swinging edges of the lids, so as to be movable to positions overlying said upwardly facing surface area on said upper perpendicular flanges,

two catch means mounted on the upper perpendicular flange of each end frame, said tabs being cooperable with said catch means, one with each, to releasably catch said lids in said overlying positions,

said hinged lids having corner portions, including said tabs, scored across with crease lines which are on the undersides thereof when the hinged lids are folded out and downward, and the side walls of the container having slots located for reception of said tabs when the lids are bent outwardly and down alongside the side walls of the container,

said score lines enabling inward bending of said corner portions thereon and entry of said tabs into said slots.

3,935,991

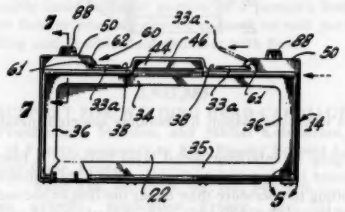
PLASTIC REINFORCED PRODUCE CONTAINER

Walton B. Crane, Sherman Oaks, Calif., assignor to A & E Plastik Pak Co., Inc., City of Industry, Calif.

Division of Ser. No. 307,962, Nov. 20, 1972, Pat. No. 3,878,980, which is a continuation-in-part of Ser. Nos. 193,874, Oct. 29, 1971, abandoned, Ser. No. 227,798, Feb. 22, 1972, abandoned, and Ser. No. 238,320, March 27, 1972, abandoned. This application Mar. 17, 1975, Ser. No. 559,088

Int. Cl.² B65D *61/00*

U.S. Cl. 229—34 R **3 Claims**



1. In a generally rectangular container with rigid rectangular, reinforcing end frames at opposite ends thereof, the container having rectangular bottom, opposed side and end walls, and lids which are respectively hinged to the upper edges of said opposed side walls, said rectangular end frames comprising integral, coplanar, upper, lower and side flanges parallel with the end walls of the container and lying thereadjacent, and rectangular integral upper, lower and side flanges, integral with and projecting perpendicularly from said coplanar flanges from the outer margins thereof, whereby to provide reinforcing caps receiving therein the corresponding end walls of the container and end portions of said bottom walls, with the perpendicular side flanges thereof lying closely adjacent said side walls of said container:

horizontal upwardly facing and downwardly facing surface areas formed on the exterior sides of said upper and lower perpendicular flanges,

the upwardly facing surface areas on said upper perpendicular flanges being at substantially the level of the underside of the hinged lids when said lids are closed, and

said lids having substantially coplanar tabs which project laterally and overlie said upwardly facing surface area on said upper perpendicular flanges,

two hooks mounted on the upper perpendicular flange of each end frame, said hooks facing toward one another, and

said laterally projecting tabs having edge shoulders facing generally in the direction of the hinge line of the corresponding lid and being adapted for engagement in the throats of said hooks, and said edge shoulders, when unengaged with said hooks, normally falling short of the forward extremities of said hooks, and thereafter recede into said throats by resilient return flexure of said side wall when said manual stress is relieved.

3,935,992

BOX THAT FUNCTIONS BOTH AS ENCLOSED CONTAINER AND OPEN RECEPTACLE

Kohei Uriu, No. 107, Minamiushiroya, Yashiomachi, Minami Saitama, Saitama, Japan

Filed Nov. 27, 1974, Ser. No. 527,892

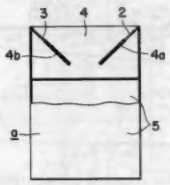
Claims priority, application Japan, Feb. 26, 1974, 49-22238[U]

Int. Cl.² B65D *5/10*

U.S. Cl. 229—38 **5 Claims**

1. A box that functions both as an enclosed container and

an open receptacle, comprising a bottom member, side wall members extending upwardly from said bottom member, lid members extending from said side wall members and being of the same uniform width as said side wall members from which they extend and being of sufficient length such that when all of said lid members are folded at the junctures of said lid members and said side wall members there is formed to top that effectively covers the box permitting same to function as an enclosed container, at least two of said lid members each



being provided with two slotted openings spaced inwardly from the free edges thereof such that as said at least two of said lid members are folded inwardly and downwardly along their corresponding side wall members said slotted openings are thereby positioned to slope downwardly and inwardly from positions near the corners of the tops of their corresponding side wall members such that as at least two of the remaining of said lid members are folded inwardly and downwardly the edges thereof are positioned within said slotted openings to thus form an open receptacle.

3,935,993

FREE-STANDING CONTAINER

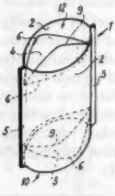
Leon Doyen, and Louis Doyen, both of 79, rue de Bourgogne, Lyon 9 (Rhone), France

Filed Jan. 21, 1974, Ser. No. 435,095

Claims priority, application France, Jan. 26, 1973, 73.03616

Int. Cl.² B65D *11/02, 11/10, 11/22*

U.S. Cl. 229—53 **10 Claims**



1. A free-standing container comprising:

a pair of like coextensive, rectangular and outwardly convex side wall panels having rectilinear opposite parallel longitudinal edges seamed together by heat seals all along said edges;

a pair of like end wall panels each having a periphery and each formed with a fold extending between the seamed lateral edges and subdividing the periphery into a pair of like sections, all of said panels being formed of a thermoplastic synthetic resin; and

respective nonstraight seams of heat seals joining each of said sections to a respective side panel and extending between its lateral edges, one of said end wall panels constituting the bottom of said container and the other end wall panel constituting the cover thereof.

3,935,994

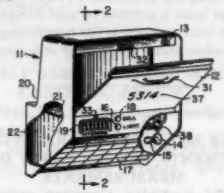
SECURITY MAILBOX

Arthur Darvishian, 5314 Sheridan Dr., Williamsville, N.Y. 14221

Filed Sept. 25, 1973, Ser. No. 400,535

Int. Cl.² B65D *91/00*

U.S. Cl. 232—36 **6 Claims**



1. A security mailbox attachable to a wall of a dwelling, comprising a mail receptacle, door means mounted thereon for the deposit of mail into the receptacle and withdrawal therefrom, an activating switch mounted behind said door means, responsive to the opening of said door means, for activating an alarm, a light transmitting shelf in the mail receptacle on which the deposited mail rests, a downwardly and inwardly angled light transmitting panel at a front bottom portion of the mailbox, illuminating means located within the box and below the shelf so that when activated it lights the box interior and the area about the mailbox at night, mounted on the front of the box, an intercommunication transmitter-speaker unit, a manually operable switch for turning on the illuminating means and a manually operable switch for activating a bell, and mounted within the box, switch means for turning on the illuminating means in response to the opening of the door, and wiring means for transmitting electric power to the alarm switch, to the intercommunication transmitter-speaker unit, to the illuminating means and to the bell switch, which wiring means are communicable through an opening in a back wall of the mailbox with the interior of the dwelling to which the security mailbox is attachable.

3,935,995

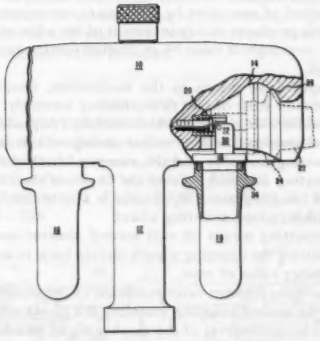
SWINGING BUCKET CENTRIFUGE ROTOR

John Francis Williams, New Canaan, and Mark William Hayden, Bridgeport, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 7, 1975, Ser. No. 575,404

Int. Cl.² B04B *9/12*

U.S. Cl. 233—26 **9 Claims**



1. In a swinging bucket centrifuge having a rotor which defines a plurality of peripheral cavities therein and is adapted to turn about its axis and hanger means in each said cavity for pivotally supporting a bucket nominally in a vertical orienta-

tion and yet permitting said bucket to swing under the influence of a centrifugal force to a horizontal orientation during operation, each said hanger means being capable of movement radially of said axis during operation to facilitate seating its said bucket in its said cavity, the improvement comprising:

a receptacle defined by said rotor radially contiguous each said cavity adapted to slideably receive along a radius of said rotor at least a portion of said hanger means, and

means in each said receptacle for preventing the rotation of a hanger means about its path of movement.

3,935,996

COUNTER MECHANISM FOR CONTINUOUS MEASUREMENTS, PARTICULARLY DISTANCE MEASUREMENTS

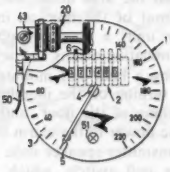
Helmut Kleinböhl, Goddelau, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 20, 1975, Ser. No. 551,253

Claims priority, application Germany, Mar. 9, 1974, 2411305

Int. Cl.² G01C *22/00*; G01P *3/02*; G01D *13/08*; G06M *1/24*

U.S. Cl. 235—95 R **7 Claims**



1. A counting mechanism for the digital measurement of increments of a selected physical quantity, such as distance travelled by a motor vehicle, said counting mechanism comprising:

a first and a second odometer-type counting assembly, each having a plurality of counting wheels arranged side-by-side on a common shaft, each counting wheel bearing the numbers 0 – 9 on its periphery, said wheels being interconnected one with another so that the advancement of a wheel of one value by an amount corresponding to 10 digits produces an advancement of the adjacent wheel of the next highest value by an amount corresponding to one digit;

an input drive means to the mechanism, coupled to the common shaft of said first counting assembly;

a subsidiary drive means mechanically coupled between a predetermined one of said counting wheels in said first counting assembly and the common shaft of the second counting assembly so that the common shaft of the second counting assembly rotates in synchronism with said predetermined counting wheel;

and resetting means on said second counter assembly for resetting the counting wheels therein back to an indicated number value of zero;

whereby the number value indicated by the counting wheels of the second counting assembly is a direct visual indication to an observer of the mechanism of an attainment of a predetermined number of said increments of the selected physical quantity during a first period of time, and thereafter said counting assembly can be reset to zero to indicate said attainment during a second and subsequent periods of time.

3,935,997

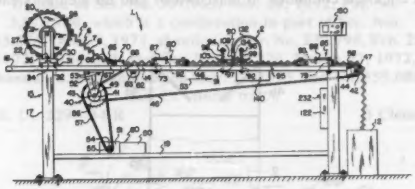
PLEAT COUNTER APPARATUS

Michael R. Loje, 959 Rose Blvd., Highland Heights, Ohio 44143

Filed Oct. 29, 1973, Ser. No. 410,887

Int. Cl.² G06M *7/00*; G06G *7/00*

U.S. Cl. 235—98 C **17 Claims**



1. An apparatus for counting corrugations of any configuration in a sheet material, comprising

support means for supporting said sheet material thereon,

a corrugation detection assembly mounted on said support means in confronting relation to the peak of each corrugation and including,

light producing means including a light source on said support means for delivering light toward said sheet material for reflection therefrom,

light sensing means including a light sensitive element for sensing light of a predetermined level of intensity reflected from each corrugation and for producing a first output signal when light of said predetermined level of intensity is reflected from said material, and

commonly supported and directed light projecting and receiving means for projecting light from said light source and for receiving reflected light from said sheet material,

said light projecting and receiving means including transmitting means for directing light in one direction toward said sheet material and for receiving reflected light from said sheet material in a direction substantially opposite from and generally parallel to said one direction and generally perpendicular to said sheet material so that said reflected light from the corrugation being counted will not be obstructed by an adjacent corrugation to assure exposure of said receiving means to reflected light of said predetermined level of intensity from the corrugations being counted and to enable counting of corrugations of any generally similar configuration,

feed means mounted on said support means for moving said sheet material relative to said support means, and

pulse counting means for counting said first output signal to indicate the number of corrugations of any generally similar configuration moving relative to said corrugation detection assembly.

3,935,998

VALVE CONSTRUCTION AND SYSTEM UTILIZING THE SAME

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

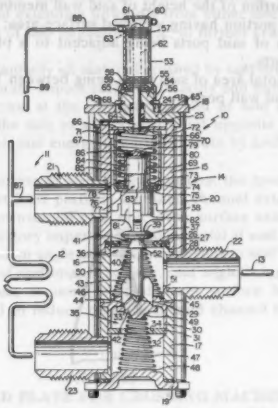
Division of Ser. No. 290,558, Sept. 20, 1972, Pat. No. 3,818,981. This application Apr. 17, 1974, Ser. No. 461,531

Int. Cl.² G05D *23/02*

U.S. Cl. 236—1 C **12 Claims**

1. A valve construction comprising a housing means having an inlet and a pair of outlets, a pair of valve seat means carried by said housing means for respectively controlling fluid flow from said inlet to said outlets, a pair of valve member means for respectively controlling said valve seat means, said valve member means being operatively associated together to move substantially in unison, and means operatively associated with said valve member means to position the same to act respec-

tively on one side of said pair of valve seat means or on the other side of said pair of valve seat means, said pair of valve member means being arranged relative to said valve seat means such that increasing the fluid flow to either of said outlets will decrease the fluid flow to the other of said outlets



regardless of which side of said pair of valve seat means said pair of valve member means are acting, said means for positioning said valve member means to act respectively on said sides of said valve seat means comprising a temperature responsive device.

3,935,999

SPRAY CONFINING AEROSOL DEVICE

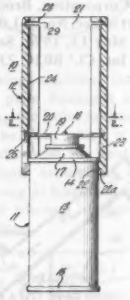
Hendrik Frans Weyn, Le Chesnay, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,510

Claims priority, application France, Dec. 19, 1973, 73.45487

Int. Cl.² B05B *1/28, 15/04*

U.S. Cl. 239—288.5 **7 Claims**



1. An aerosol spray device comprising a pressurized aerosol container including an axially directed spray nozzle and a transverse, outwardly directed, depressible valve actuator; a shield defining sleeve coaxial with and slidably engaging said container and movable between a raised extended position projecting above said container and a lower, contracted position telescoped onto said container; and actuator depressor means located on and movable with said sleeve and adapted to engage said valve actuator whereby to urge said actuator to a depressed, valve open position upon the depression of said sleeve below its extended position, said valve actuator including an arm projecting radially beyond the periphery of said container, and said actuator means includes an inwardly directed shoulder member positioned on the lower inner border of said sleeve and projecting to a point between the outer periphery of said container and the outer end of said actuator arm, said shoulder member extending for less than the full periphery of said sleeve.

3,936,000

DEPRESSIBLE AEROSOL SPRAY ACTUATING CONFINING DEVICE

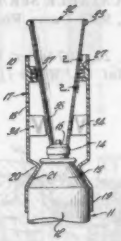
Hendrik Frans Weyn, Le Chesnay, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,516

Claims priority, application France, Dec. 19, 1973, 73.45491

Int. Cl.² B05B *1/28, 15/04*

U.S. Cl. 239—288.5 **6 Claims**



1. An aerosol spray confining device for use with a pressurized aerosol container provided on the top wall thereof with an axially directed spray nozzle, a valve, and a valve actuator which upon depression opens said valve, comprising a longitudinally extending tubular shield member and means for mounting said shield member on said container, in communication with said nozzle, for longitudinal movement between an advanced position engaging and depressing said valve actuator to open said valve and a retracted position releasing said actuator to a valve closed condition, said mounting means comprising a sleeve member having a lower end releasably engaging the upper end of said container and supporting said shield member coaxially with said container for movement between said advanced and retracted positions, said shield member projecting above said sleeve, said valve actuator including a depressible circular member coaxial with said nozzle and said shield member being of frustoconical configuration and coaxial with said sleeve with its reduced lower end registering with said valve actuator.

3,936,001

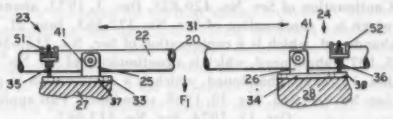
ANTI-SAG DEVICE FOR PAPER MILL SHOWERS

William Richard Clendaniel, Andover, Mass., assignor to Bolton-Emerson, Inc., Lawrence, Mass.

Filed Dec. 9, 1974, Ser. No. 530,737

Int. Cl.² B05B *1/20, 13/02;* **D21F** *1/32;* **F16L** *3/10*

U.S. Cl. 239—289 **4 Claims**



1. Anti-sag apparatus for elongated shower pipes of the type

extending across a paper stock treatment machine said apparatus comprising:

an elongated pipe of predetermined length and diameter having opposite ends;

a pair of brackets, each fixed under one of said ends and each having a support means thereon, fixed at a predetermined distance inboard of said end for supporting said pipe against downward movement and

each said bracket having downward deflection means, located at a predetermined distance outboard of one of said support means for holding down the adjacent end of said pipe

whereby the portion of said pipe, between said brackets, may be free of braces, tie rods and reinforcing structures, supported against sag and of a diameter and thickness required for hydraulic capacity rather than for structural stiffness.

3,936,002

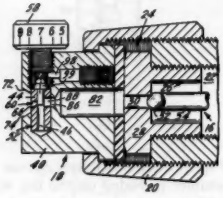
ADJUSTABLE SPRAY TIP

John D. Geberth, Jr., Rifle Camp Road, West Paterson, N.J. 07424

Filed Nov. 29, 1974, Ser. No. 528,558

Int. Cl.² B05B 1/32

U.S. Cl. 239—455 **14 Claims**



1. An adjustable spray nozzle for use with a spray gun, said spray gun being adapted for hydraulically atomizing and spraying liquids and including conduit means communicating with a source of liquid under pressure, said adjustable spray nozzle comprising:

a. a spray tip housing including means for securing said housing to said spray gun;

b. a fluid bore in said housing communicating with said conduit means and terminating in a spray opening in said housing having substantially sharp edges to thereby permit the transference of pressurized liquid from said source to said spray opening; and

c. valve means included in said spray tip housing for varying the size of said spray opening from a closed position to a fully open position including all intermediate positions therebetween to thereby adjust the spray of liquid issuing from said spray opening.

3,936,003

MULTIPORT HIGH DENSITY BURNER

William H. Hapgood, Brookline, and Donald G. Protopapas, Wilmington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 420,825, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 372,363, June 21, 1973, abandoned, which is a continuation of Ser. No. 215,656, Jan. 5, 1972, abandoned, which is a continuation of Ser. No. 2,584, Jan. 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 787,915, Dec. 30, 1968, abandoned. This application Oct. 11, 1974, Ser. No. 513,962

Int. Cl.² B05B 1/14

U.S. Cl. 239—559 **6 Claims**

1. In combination:

a multiport burner wall member substantially surrounding a plenum;

said wall member having a plurality of circular ports having a diameter in the range of 0.02 in. to 0.04 in. distributed in a uniform pattern having a plurality of rows about the circumference of said wall and throughout a substantial portion of the height of said wall member;

said portion having a curved surface area;

each of said ports being adjacent to a plurality of other ports;

the total area of said ports being between 15% and 30% of said wall portion;

the angular divergence between the center lines of adjacent ports in said curved surface area being less than 14 degrees;

means for producing a flame front outside said plenum extending across the regions between adjacent jets and spaced from said wall member comprising a blower for supplying a fuel-air mixture to said plenum at a pressure producing jets of said fuel-air mixture through said ports having velocities substantially greater than the combustion wave velocity of said mixture; and

ignition of said fuel-air mixture within said plenum being prevented by said wall member.

3,936,004

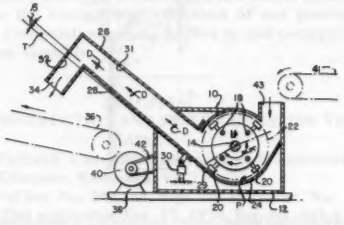
MATERIAL REDUCER

Carl R. Graf, Whitehall; Harry E. Janes, Chester, and Anthony W. Slikas, Norristown, all of Pa., assignors to Pennsylvania Crusher Corporation, Broomall, Pa.

Continuation-in-part of Ser. No. 361,002, May 16, 1973. This application May 13, 1974, Ser. No. 469,563

Int. Cl.² B02C 23/38

U.S. Cl. 241—5 **25 Claims**



1. A method of crushing massive, high density materials such as rock and coal, comprising the steps of:

introducing mineral feed into a housing through an inlet open to the atmosphere;

allowing the mineral feed to drop from said inlet into the impactor circle of a rotor rotating within said housing, said rotor having impact members defining said impactor circle;

impacting said feed material with said rotating impact members as said feed material drops into said impactor circle to crush said materials;

causing said reduced material to move into contact with an imperforate impact surface in a rotor-feed material-impact surface inter-reaction zone subtending an arc including and extending upwardly from either side of the lowest point of said impactor circle, to further crush said material;

throwing substantially all material crushed by said rotor and said imperforate impact surface upwardly and outwardly from said rotor at the downstream end of said impact surface on the side of said lowest point opposite to the side on which said energy imparted thereto by said rotor; and

impinging a portion of said material against the lower surface of an at least partially confined channel extending from said downstream end, said lower surface extending into the trajectory imparted to said material at said downstream end at an angle above a line tangent to said downstream end of said impact surface, said angle being sufficient to cause scouring of said lower surface by said material and to reduce clogging of said channel by said material.

3,936,005

PERFORATED PLATE FOR CRUSHING MACHINES

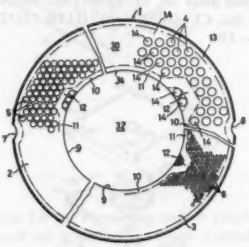
Karl Schnell, Muhlstr. 28, Winterbach, Germany (7065)

Filed June 26, 1974, Ser. No. 483,422

Claims priority, application Germany, June 30, 1973, 2333399

Int. Cl.² A47J *43/07*

U.S. Cl. 241—83 **7 Claims**



1. A plate for crushing machine, comprising a circular perforated ring-shaped plate having a central hole and an annular area surrounding the hole, said annular area having a narrow strip adjacent the hole which is not perforated and which is spaced outwardly from the center of the perforated plate by unequal amounts around its circumference, said non-perforated strip having at least one annular sector and at least one loop area and wherein at least one perforation is located with the loop area.

3,936,006

STRAND WINDING

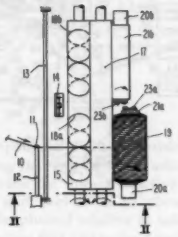
Ralph W. List, East Lansdowne, and Robert K. Stanley, Media, both of Pa., assignors to Textured Yarn Co., Inc., Kennett Square, Pa.

Filed May 6, 1974, Ser. No. 467,018

Int. Cl.² B65H *67/04*

U.S. Cl. 242—18 A **6 Claims**

1. In apparatus for uninterrupted package winding of textile strands including transfer from winding onto a first package to winding onto a second package axially aligned therewith, the respective packages being carried upon respective spindles individually movable into contact with rotative drive means with their adjacent ends closely spaced and out of mutual contact, improved mechanism for so transferring such a strand, comprising a strand guide locatable on an extended lateral bisector of either package, a bistable inertial device located between the respective extended lateral bisectors and bridging a parallel extension of the space between and including the respective adjacent spindle ends and being adapted in a stable strand-receiving position to be contacted by and to retain the laterally transferring strand while in that position when the strand guide is transferred from one extended lateral bisector to the other and further adapted to be switched by lateral force of the strand to an alternative stable strand-



releasing position and to release the strand upon assuming that position and thereby to delay the lateral transfer of the strand, wherein the bistable inertial device comprises generally Y-shaped flip-flop means pivotably mounted at its base leg for limited tilting to either side and adapted to be tilted to the opposite side by contact of laterally transferring strand moving from the side to which already tilted, into contact with the raised arm of the device, thereby tilting the means to the opposite side, whereupon the engaged arm becomes lower and the strand is released therefrom after momentary delay involved in so tilting it.

3,936,007

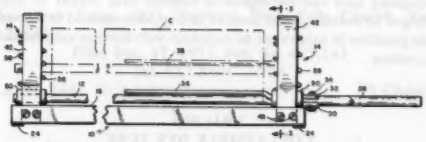
PAPER LOG ROLLER

David E. Butz, Boston, Mass., assignor to Belmont Industries, Incorporated, Reading, Mass.

Filed Oct. 3, 1974, Ser. No. 511,775

Int. Cl.² B65H *17/02*

U.S. Cl. 242—67.1 R **12 Claims**



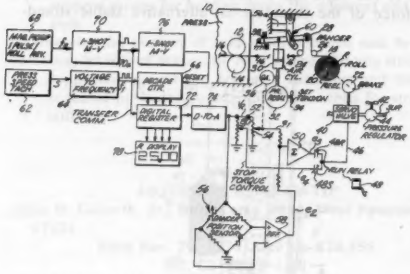
1. A device for coiling sheet material to form a combustible log, comprising a base having a top side, posts mounted to the top side of the base at opposite ends, bearing members mounted on the posts for vertical sliding movement thereon perpendicular to the base said bearing members containing bearing openings, a spindle rotatably mounted in said openings with its axis parallel to the base for rotation about an axis parallel to the base and for movement perpendicular to the base, spring means yieldably resisting movement of the bearing members perpendicular to the base, means on the spindle for connecting an end of the sheet to be coiled thereon to the spindle, and a crank at one end of the spindle for effecting rotation thereof.

3,936,008

REEL STAND TENSION CONTROL SYSTEM

James N. Crum, Stonington, Conn., assignor to Harris Corporation, Cleveland, Ohio

Filed July 1, 1974, Ser. No. 484,997
Int. Cl.[2] B65H *23/08, 25/22*
U.S. Cl. 242—75.44 **15 Claims**



1. In a web tension control system for a reel stand used with a web-fed printing press in which web material is pulled toward the press by a pulling means and unwound from a roll on a reel in which a dancer engages the web material between the roll and the pulling means for applying a transverse force to the web material that is substantially constant for all transverse positions within a range of positions and having means to apply torque to the reel in response to a control signal to control the length of said web material between the roll and the pulling means and thereby controlling the dancer's position, radius signal means for producing a radius signal which varies in accordance with the radius of the roll of web material, sensing means for sensing the position of said dancer, first circuit means coupled to said radius signal means and to said sensing means for providing a second signal which is in proportion to said radius signal and which varies in response to deviation of the position of said dancer from a predetermined position, signal combining means for producing said control signal, means coupling a first signal from said radius signal means to said signal combining means, means coupling said second signal to said signal combining means, and means coupling said control signal to control said means to apply torque to maintain said dancer in a predetermined intermediate position in said range to maintain web tension substantially constant.

3,936,009

COLLAPSIBLE DYE TUBE

Stanley Livingstone, Wilkinson Blvd., P.O. Box 8282, Charlotte, N.C. 28208

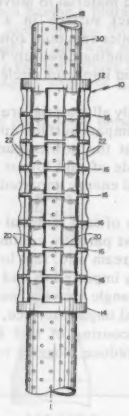
Filed Aug. 26, 1974, Ser. No. 500,474
Int. Cl.[2] B65H *75/20*
U.S. Cl. 242—118.11 **8 Claims**

1. In a system consisting of a perforated dyeing spindle and a plurality of dye tubes useful with yarn wound therearound, in stacked, end-to-end relationship on said spindle, that improvement consisting of an improved dye tube comprising,

a multiplicity of continuous yarn-supporting rings spaced along an axis, and

a multiplicity of connectors spaced circumferentially about said tube and extending between adjacent said rings,

each said connector having its opposite ends respectively joined to said adjacent rings and having an inherently preferentially radially inwardly movable buckling portion between said ends, whereby upon the application of axial



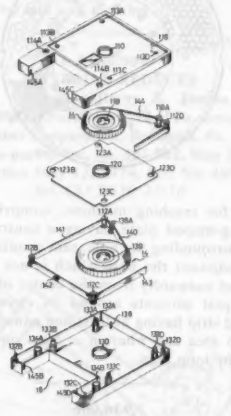
force to said tube said adjacent rings will approach each other while said connectors buckle toward said axis.

3,936,010

CASSETTE FOR FILM AND DRIVING MEANS THEREOF

Shui-Ting Lu, No. 28-3, Sin Sen South Road, Sec. 3, Taipei, China /Taiwan

Filed June 28, 1974, Ser. No. 483,958
Int. Cl.[2] G03B *1/04;* **G11B** *15/32*
U.S. Cl. 242—194 **4 Claims**



1. A cassette for film comprising a rectangular case including an upper and a lower compartment forming halves of said case, a partition plate disposed between the halves of the case, a supply reel and a take-up reel rotatably and coaxially mounted within each half of the case respectively on opposed sides of said partition plate, a plurality of tapered, rotatable guide rollers located substantially adjacent the corners of said case for successively receiving the film from one of said reels, for directing the film from the plane of said one reel toward a plane intermediate the planes of said reels, then in a plane parallel to and intermediate the planes of said reels, then in a direction toward the plane of the second of said reels and

finally directing the film into the plane of said second of said reels, and a rotatable cylindrical correcting guide roller disposed between each of the first and last tapered guide rollers and the associated reel and adjacent said first and last tapered guide rollers respectively, whereby the film is always passed around the same circumferential distance of said first and last tapered guide rollers to provide a constant and uniform path for said film between said rotatable correcting guide rollers.

3,936,011

TAPE CASSETTE TRANSPORT

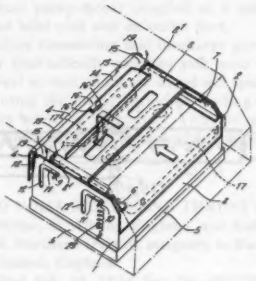
Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed Mar. 13, 1974, Ser. No. 450,721

Claims priority, application Belgium, Mar. 16, 1973, 796866

Int. Cl.² G03B *1/04*; G11B *15/32*, *23/04*

U.S. Cl. 242—198 11 Claims



1. In apparatus for the recording and/or playback of information contained on a storage medium extending between feed and take-up reels in a cartridge, the cartridge having openings in at least one of its surfaces for receiving drive means for the reels, the improvement comprising:

a housing including a pair of opposed channel defining members, said channel defining members being spaced to slideably receive a storage medium containing cartridge within said housing, said housing and cartridge being movable bodily serially in two directions substantially perpendicular to each other to transport the received cartridge;

means for supporting said housing on the recording and/or playback apparatus; and

means for guiding the movements of said housing in said two directions, said movements in a cartridge loading operation consisting of initial movement of said housing and cartridge bodily in a direction to bring the cartridge drive means receiving openings into alignment with drive means on the recording and/or playback apparatus, and subsequent movement of said housing and cartridge bodily in a second direction to cause the cartridge to be engaged with the drive means;

and said movements of said housing and cartridge bodily in a cartridge releasing operation being the reverse of said movements in a cartridge loading operation to disengage the cartridge from the drive means and to eject the cartridge.

3,936,012

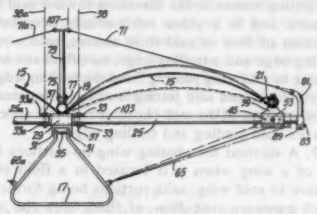
HANG GLIDER

Stephen C. Murray, 33871 El Encanto, Dana Point, Calif. 92629

Filed May 3, 1974, Ser. No. 466,682

Int. Cl.² B64C *31/02*

U.S. Cl. 244—16 14 Claims



14. A device capable of flight comprising:

a frame including first and second leading edge members, a keel, and means for interconnecting said leading edge members to said keel so as to allow the leading edge members to be pivoted relative to said keel;

said frame including first and second cross members, means for attaching said first and second cross members to said keel to allow said cross members to pivot relative to said keel, and means for attaching the first leading edge member to said first cross member;

a connector mounted on said second cross member for coupling the second leading edge member to the second cross member;

said connector being mounted for movement along said second cross member from an extended position toward the keel to facilitate at least partial collapse of said frame;

means for retaining said connector in said extended position;

a mast attached to said keel;

a flexible element having first and second spaced regions, said first region being attached to said mast;

means other than said second leading edge member for attaching said second region to the second cross member outboard of said connector; and

flexible material coupled to said leading edge members and forming a relatively broad surface to at least assist in supporting the device when the device is airborne.

3,936,013

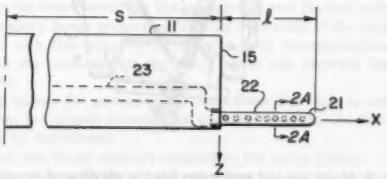
VORTEX CONTROL

Shao Wen Yuan, 2021 Highboro Way, Falls Church, Va. 22043

Filed Dec. 17, 1973, Ser. No. 425,143

Int. Cl.² B64C *23/06*

U.S. Cl. 244—40 A 19 Claims



1. Apparatus for abating wing-tip vortices formed at the tips of a wing when it is in a fluid stream flowing relative to said wing, said vortices being formed as a result of a difference in fluid pressure on one side of the wing relative to the fluid

pressure on the opposite side of the wing which causes a rush flow of fluid from the side of higher pressure to the side of lower pressure, said apparatus comprising a wing having at least a pair of wing tips, a source of pressurized fluid, a plurality of jetting means, and means connecting said jetting means to said source of pressurized fluid, each of said plurility of jetting means of being located outwardly of a respective one of said tips for simultaneously emmiting pressurized fluid from said jetting means in the direction toward said side of higher pressure and in a plane substantially perpendicular to the direction of flow of said fluid stream, said wing including a leading edge and a trailing edge, said fluid stream which flows relative to said wing passing from the leading edge toward said trailing edge, and said jetting means are located downstream of the position of the mid-chord of said tips which lies halfway between said leading and trailing edges.

17. A method for abating wing-tip vortices formed at the tips of a wing when it is located in a fluid stream flowing relative to said wing, said vortices being formed as the wing which causes a rush flow of fluid from the side of higher pressure to the side of lower pressure, said method comprising the steps of providing a wing having at least a pair of wing tips, providing a supply of pressurized fluid, and simultaneously emitting a jet of said pressurized fluid from a region located adjacent to and outwardly of each of said wing tips in a direction toward said side of higher pressure and in a plane substantially perpendicular to the direction of flow of said fluid stream, said wing including a leading edge and a trailing edge and said fluid stream passes from the leading edge to the trailing edge, and said step of emitting a jet of pressurized fluid comprises emitting said jet at a location downstream of the position of the mid-chord of said tips which lies halfway between said leading and trailing edges.

3,936,014

HAND CONTROL APPARATUS FOR AN AIRCRAFT USABLE BY A PERSON LACKING USE OF HIS LEGS

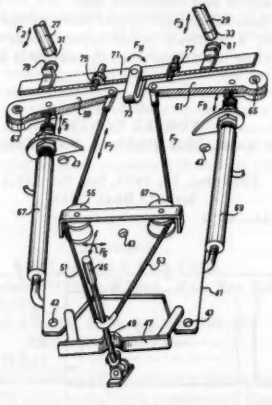
Bernard Morin, 1, rue Corneille, 78130 Les Mureaux, France

Filed July 29, 1974, Ser. No. 492,915

Claims priority, application France, July 30, 1973, 73.27873

Int. Cl.[2] B64C *13/04*

U.S. Cl. 244—83 R **9 Claims**



1. Hand control apparatus for the piloting of an aircraft by an-operator lacking use of his legs, the aircraft having means for controlling its course, means for controlling a throttle, means for heating a carburetor, a conventional joy-stick, and left and right brakes, said apparatus comprising a handle, means supporting said handle for three independent movements and means individually responsive to a respective movement of the handle for controlling the course control means, the throttle control means, and the carburetor heating means, hand-operated switch means carried by said handle for control of further elements of the aircraft, a second joy-stick, means coupled to said second joy stick for respectively operating the right and left brakes in accordance with the positioning of the second joy stick and a common support element on which said handle, said brake operating means and the means controlling the course control means are so assembled in operative position relative to one another and mutually coupled together for interrelated operation to allow complete manual control by the operator of the handle, and joy-sticks during respective flight and ground operations.

3,936,015

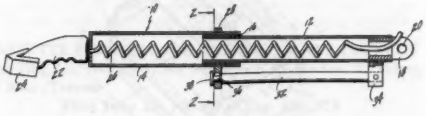
RETRACTABLE COLLECTIVE PITCH STICK

James Clement Dean, Stratford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 28, 1974, Ser. No. 484,182

Int. Cl.[2] B64C *13/04*

U.S. Cl. 244—83 F **1 Claim**



1. A collective pitch stick for a helicopter including:
a first tube having a first end connected for rotational movement of the tube in one plane about said connection and a second end remote from said first end;
a second tube having an internal diameter slightly larger than the external diameter of said first tube so as to be axially slideable thereon;
said second tube having a first end normally surrounding the second end of said first tube;
locking cam means attached to said first end of said second tube; and
index pin means connected at one end to said first end of said first tube;
said index pin means having means adjacent its other end engaging with said locking cam means to maintain said tubes in a maximum length relationship;
said index pin means having a necked-down portion engaging said locking cam means;
said locking cam means having a slot through which said index pin extends;
said slot having three interconnected areas including;
a first area having a width slightly larger than the diameter of said index pin;
a second area having a width slightly larger than the diameter of the necked-down portion of said index pin; and
a third area being a detent having a width larger than the diameter of the necked-down portion but smaller than the diameter of said index pin;
said index pin being preloaded so as to urge it into the detent of said slot third area.

3,936,016

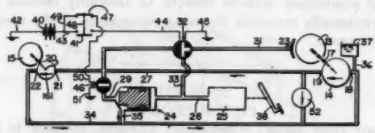
AIRPLANE'S ANTI-WHEEL-LOCK AND SPIN-UP SYSTEM

Samuel Shiber, P.O. Box 302, Des Plaines, Ill.

Continuation-in-part of Ser. No. 440,860, Feb. 8, 1974, Pat. No. 3,881,783. This application Apr. 29, 1975, Ser. No. 572,844

Int. Cl.[2] B64C 25/32

U.S. Cl. 244—103 S 6 Claims



1. In an airplane's landing gear, a hydraulic anti-lock braking and a nose wheel spin-up system comprising in combination;

a main wheel pump coupled to a main wheel and having a suction port and a discharge port,

a nose wheel pump-motor coupled to a nose wheel and having an inlet port and an outlet port,

conduit means connecting said discharge port to said inlet port, for hydraulically coupling said nose wheel to said main wheel so that said main wheel will spin up said nose wheel during the initial period of landing during which said main wheel is in contact with the ground and is rotating on it and said nose wheel is still air-borne.

3,936,017

COMBINED NOISE SHIELD AND THRUST REVERSER

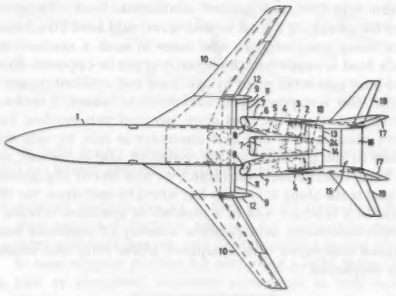
Alan Avery Blythe, St. Albans, England, and Robert Ian Milligan, Belfast, Northern Ireland, assignors to Hawker Siddeley Aviation Limited, England

Filed July 29, 1974, Ser. No. 492,741

Claims priority, application United Kingdom, July 30, 1973, 36270/73

Int. Cl.[2] B64D 33/06

U.S. Cl. 244—110 B 6 Claims



1. In an aircraft having a fuselage, wings, a tailplane and two laterally spaced fins above the tailplane, the provision of a plurality of jet propulsion engines mounted on said fuselage substantially above the level of said wings and generally aft thereof, an engine housing structure containing said engines, air intakes for said engines located forward of said engine housing structure at a level above said wings and not significantly aft of the trailing edges thereof such that the fuselage and wings provide a downward and partial sideways shield against noise emanating from said air intakes, and exhaust nozzles for said engines located to discharge into a common noise shielding duct defined at the sides by said fins and at the bottom by a fixed-incidence section of said tailplane between said fins, and wherein an upstream portion of said fixed-incidence tailplane section is deflectable in conjunction with a deflectable aft end portion of said engine housing structure to form a thrust reverser common to all engines, said deflectable portion of said fixed-incidence tailplane section being mounted to swing about a first transverse pivot axis intermediate the forward and aft ends of said tailplane section portion so that said forward end goes down and said aft end rises, and the deflectable aft end portion of the engine housing structure being mounted to rock up and back about a second transverse pivot axis until the aft end of said engine housing end portion substantially engages the up-tilted aft end region of the deflectable portion of said fixed-incidence tailplane section.

3,936,018

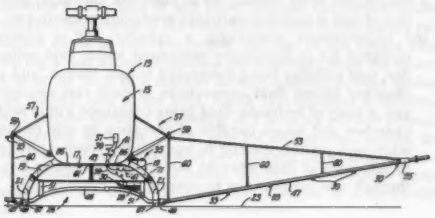
JETTISONABLE AGRICULTURAL SPRAYER

Conrad R. Barlow, Redondo Beach, Calif., assignor to Transland, Inc., Harbor City, Calif.

Filed Aug. 8, 1974, Ser. No. 495,588

Int. Cl.[2] B64D 1/18

U.S. Cl. 244—136 10 Claims



1. A spraying apparatus for spraying a fluid, said spraying apparatus being adapted for connection to an aircraft having a fuselage and a landing gear, said spraying apparatus comprising:

a tank for containing the fluid to be sprayed;

first means for releasably coupling the tank to the aircraft with at least a portion of the tank being generally between the landing gear;

a spray boom having at least one opening through which the fluid can be discharged;

means for interconnecting the spray boom and the tank with the spray boom projecting laterally outwardly of the tank and with the spray boom being in fluid communication with the tank so that the spray boom can dispense the fluid;

pump means for pumping the fluid from the tank to the spray boom and through the opening whereby the fluid can be distributed;

at least one boom support coupled to the spray boom;

coupling means for releasably attaching the boom support to the aircraft so that the boom support can support the spray boom against forces tending to pivot the boom downwardly; and

at least said tank and said spray boom being releasable from the aircraft upon the release of said coupling means and said first means.

3,936,019

EJECTOR RELEASE UNIT FOR USE IN AIRCRAFT

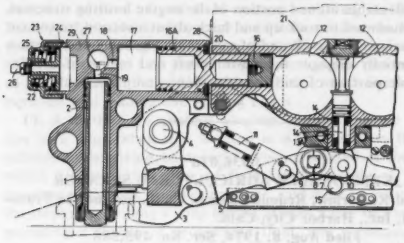
Samuel W. Craigie, Maidenhead, England, assignor to M. L. Aviation Company Limited, England

Filed Feb. 19, 1974, Ser. No. 443,250

Claims priority, application United Kingdom, Feb. 19, 1973, 8060/73

Int. Cl.² B64D *1/02*

U.S. Cl. 244—137 R 6 Claims



1. In an ejector release unit for releasing and projecting a store from an aircraft,

a latching mechanism for projecting and releasing said store;

a pair of ejection guns for projecting said store from said aircraft;

a breech and firing contact for at least one cartridge, ignition of said at least one cartridge producing pressure gas;

the improvement comprising a cylinder and a piston mounted for reciprocatory movement within said cylinder, said cylinder being connected to said breech; and a chamber having fluid connections to each said ejection gun, a body of hydraulic fluid being contained within said chamber; and means capable of operation by said piston when said gas acts thereon to transmit the resultant force to said body of fluid whereby said fluid is caused to flow through said connections to operate said ejection guns.

3,936,020

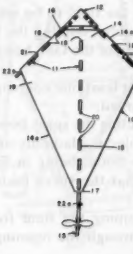
KITE CONSTRUCTION

Andrew W. Jackson, 214½ E. Main, Walla Walla, Wash. 99362

Filed Aug. 3, 1973, Ser. No. 385,286

Int. Cl.² B64C *31/06*

U.S. Cl. 244—153 R 3 Claims



1. A statically indeterminable kite, comprising in combination:

a thin surface element of flexible material of general lozenge-like shape having an axis of symmetry through the diagonal with at least a plurality of spaced parallel slits extending perpendicularly to and on both sides of the axis of symmetry and a plurality of spaced parallel slits lineally aligned substantially perpendicular to and immediately inwardly adjacent two adjacent sides that communicate with the diagonal coincident with the axis of symmetry, which cooperate to form the nose-piece of the kite;

elongated rigid support elements carried in each lineal array of slits by weaving therethrough with face material between the slits alternately on one side and then the other of each support element, each of said support elements being somewhat longer than the slit array to project slightly therebeyond at least at the nose-piece end; and

a three dimensional semi-rigid nose-piece having a plurality of positioned orifices therein to slideably receive and frictionally maintain the nose-piece ends of the support elements.

3,936,021

PIPE SUPPORTS

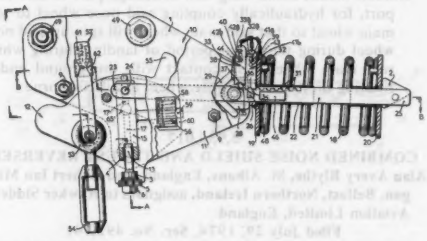
Anthony John Salter, Woodsetton, England, assignor to Pipe Supports Limited, Warley, England

Filed Mar. 15, 1974, Ser. No. 451,348

Claims priority, application United Kingdom, Mar. 17, 1973, 12942/73

Int. Cl.² F16L *3/00*

U.S. Cl. 248—54 CS 2 Claims



1. A support comprising a frame, a lever pivoted to said frame, a first abutment pivoted to said frame, a draw bar slidably mounted in said first abutment and having one end connected to said lever, a second abutment connected to the other end of said draw bar, elongated resilient means acting between said first and second abutments, load attachment means for attaching a load to said lever, said load attachment means being connected to said lever in such a manner that when a load is supported the lever is urged in opposite directions about said lever pivot by said load and resilient means so that the load is supported by said resilient means, a series of teeth spaced along the said draw bar and two toothed keys slidably mounted on said first abutment in side by side relationship in the direction of the length of said draw bar, said keys being alternatively movable into and out of engagement with said teeth along said draw bar whereby said draw bar may be held in a selected one of a number of positions relative to said first abutment, said possible number of positions being increased compared with a support where only one toothed key is employed.

3,936,022

LANTERN AND SUPPORT STRUCTURE THEREFOR

Thomas H. Nicholl, 1204 W. 27th, Kansas City, Mo. 64108

Filed Dec. 2, 1974, Ser. No. 528,874

Int. Cl.² A47F *5/12*

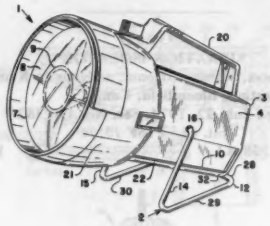
U.S. Cl. 248—137 7 Claims

2. In combination:

a. a housing having laterally spaced side walls and opposite ends;

b. an elongated outstanding portion on each of said side walls in opposed relation and each having a crest extending longitudinally of said housing;

c. a support structure for said housing and having a base portion and laterally spaced arms extending from said base portion, said arms each having a gudgeon thereon pivotally supported on a respective one of said side walls of said housing, said arms being resiliently retained in frictional engagement with said crests whereby said housing may be moved to a selected position relative to said arms and frictionally retained in the selected position;



d. said arms of said support structure are biased toward said respective side wall of said housing; and

e. said outstanding portions each have an end portion adjacent one of said opposite ends of said housing terminating in shoulders inclined toward said respective side wall, said shoulders being engaged by said arms when said base portion of said support structure is moved to a position in facing relation with said one end of said housing.

3,936,023

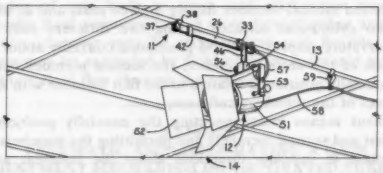
LIGHT HOLDER

Arthur E. Clifton, Three Rivers, Mich., assignor to Armstrong Machine Works, Three Rivers, Mich.

Filed July 23, 1974, Ser. No. 490,980

Int. Cl.[2] F16B *1/00;* **E04G** *17/18;* **F16B** *12/00*

U.S. Cl. 248—228 **11 Claims**



1. A light holder adapted to be suspended from an elongated rail having oppositely extending lateral flanges, comprising:

a support portion having a first pair of oppositely-facing clips mounted thereon adapted for supporting engagement with said flanges, and light mounting means secured to said support portion for mounting a light thereon;

a pair of elongated members connected to said support portion and extending away therefrom in adjacent and substantially parallel relationship so that said elongated members are adapted to extend lengthwise of said rail, said members being relatively movable laterally toward and away from each other, a second pair of oppositely facing clips respectively mounted on said elongated members at locations spaced from said first pair of clips and adapted for supporting engagement with said flanges, said elongated members permitting relative lateral movement between the clips of said second pair so that at least one of the clips of said second pair can be moved laterally relative to said support portion into and out of supporting engagement with its associated flange of said rail.

3,936,024

SUPPORTING-FRAME STRUCTURES

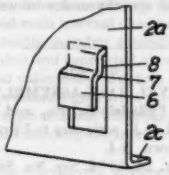
Otto Jung, Obergoesgen, Switzerland, assignor to H. Heer & Co., Olten, Switzerland

Filed June 19, 1974, Ser. No. 480,858

Claims priority, application Switzerland, June 20, 1973, 8939/73; Jan. 28, 1974, 1098/74

Int. Cl.[2] A47F *5/10*

U.S. Cl. 248—243 **8 Claims**



1. Carrying device for supporting cable ducts and the like comprising: a vertical bearer member and horizontal bearer arms suspensible from the vertical bearer member at selectible height, said bearer member having at least one vertical row of spaced holes, each of said holes having a vertical side, characterized in that each bearer arm has two spaced hooks one above the other adjacent to one horizontal extremity of said arm, said hooks projecting from the bearer arm and adapted to pass through mating spaced holes in said vertical bearer member so that each of said hooks engages the vertical bearer member in the area of the hole, each of said hooks having two lateral edges of different length, the side of the longer edge having a first shoulder pressed out slantingly from the bearer arm in the form of a support surface adapted to abut against the vertical side of the hole, which first shoulder is followed by a second shoulder consisting of a hooking portion projecting farther from the bearer arm for engagement behind the vertical bearer member with said support surfaces positioned on opposite sides of said hooks, whereby the moment forces acting on the bearer arm are transmittable in a horizontal direction.

3,936,025

EDGE PROTECTOR DEVICE

David L. Cass, 573 Isham St., New York, N.Y. 10034

Filed May 23, 1974, Ser. No. 473,079

Int. Cl.[2] A47B *95/00*

U.S. Cl. 248—345.1 **6 Claims**

1. A unitary device universally adaptable as a protector against injury from corners, straight edges and other sharp borders of a piece of furniture, said device being formed of soft moldable resilient material and composed of two walls joined together at their inner edges to form an elongated joint adapted to lie across a corner or overlay a straight edge or other sharp border of a piece of furniture, said walls being disposed at approximately 90°, but capable of flexture relative to each other about said elongated joint, a first means provided on one of said walls for detachably securing such wall of the device to a surface of a piece of furniture with said

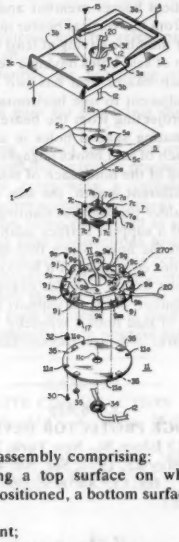
elongated joint adapted to overlay a corner, straight edge or other sharp border of the furniture piece and the other of said walls adapted to overlay a part of the furniture piece disposed at an angle to such furniture surface, second means on said one wall between said securing means and said elongated joint adapted to engage said furniture surface when the device is attached thereto and to coact with said first securing means to exert a cushioning action against blows delivered to said one wall of the attached device, and third means on said other wall adapted to engage a part of the furniture piece and restrain displacement of said elongated joint relative to a furniture piece corner overlaid thereby under blows delivered to the device.

3,936,026

SWIVEL BASE ASSEMBLY

Herbert J. Hampel, Philadelphia, Pa., and William A. Hoffman, Collingswood, N.J., assignors to Ultronic Systems Corporation, Moorestown, N.J.

Filed Mar. 24, 1975, Ser. No. 561,639
Int. Cl.[2] H02G *11/00*
U.S. Cl. 248—349 6 Claims



1. A swivel base assembly comprising:

tray means having a top surface on which a device is adapted to be positioned, a bottom surface, and including stop means;

a base arrangement;

swivel means interposed between the tray means and the base arrangement and having a first section attached to the tray means and a second section attached to the base arrangement, said first section and the tray means attached thereto being capable of rotational movement with respect to the second section and the base arrangement to which the second section is attached;

said base arrangment including:

a. stop means cooperative with the stop means of the tray means to establish a predetermined angular range through which the tray means, a device on the tray means, and the first section of the swivel means to which the tray means is attached may rotate;

b. glide means adjacent to the periphery of the swivel means and bearing against the bottom surface of the tray means providing a bearing surface along which the tray means glides when a rotational motion is imparted to the tray means with respect to the second section of the swivel means; and

c. a cable-receiving portion defining a chamber and having a cable receiving opening into said chamber, said chamber being arranged to receive a cable means via the cable receiving opening to be used by a device on the tray means and having a capacity to permit said cable means to be wound therein in a generally circular pattern;

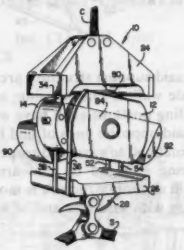
said tray means, swivel means and base arrangement each further having an opening therein by which one end of a cable means wound within the chamber of the base arrangement may be fed through the opening in the base arrangement, the opening in the swivel means and the opening in the tray means to a device on the tray means.

3,936,027

VIBRATION ISOLATOR

Michael A. Bowes, Windsor, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed July 22, 1974, Ser. No. 490,383
Int. Cl.[2] F16F *15/04*
U.S. Cl. 248—358 AA 11 Claims



1. An improved vibration isolator for reducing the transmission of vibrations at a given frequency between a first and a second body joined together by the isolator comprising:

a first inertial member having a given mass and at least two cylindrical surfaces having two different radii of curvature respectively and positioned coaxially about an axis of the first member;

a second inertial member having a given mass and at least two cylindrical surfaces having two different radii of curvature respectively and positioned coaxially about an axis of the second member, the second member being coaxially positioned relative to the first member with said axes of the members collinear;

resilient means interconnecting the coaxially positioned first and second members and permitting the members to rotate in opposite directions about the collinear axes relative to one another with resilient restraint;

first cable means connected at one end to the first inertial member and extending from the member tangentially of the one of the cylindrical surfaces having the larger radius of curvature for connection with the first body;

second cable means connected at one end to the first member and extending from the member tangentially of the other of the cylindrical surfaces having the smaller radius of curvature for connection with the second body;

third cable means connected at one end to the second inertial member and extending from the member tangentially of the one of the cylindrical surfaces having the larger radius of curvature for connection with the first body; and

fourth cable means connected at one end to the second member and extending from the member tangentially of the other of the cylindrical surfaces having the smaller radius of curvature for connection with the second body;

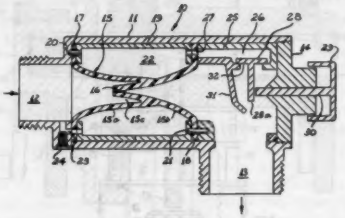
said cable means being arranged relative to each other and to the inertial members to produce simultaneous translations of the members in the same direction along the cable means and rotations of the members in opposite directions about the collinear axes.

3,936,028

FLUSH VALVE

Ian Fredric Norton, Toronto, Canada, and James O'Grady, London, England, assignors to Crane Canada Limited, Montreal, Canada

Filed July 13, 1973, Ser. No. 378,835
Claims priority, application Canada, Aug. 2, 1972, 148588
Int. Cl.² F16K 31/385
U.S. Cl. 251—5 6 Claims



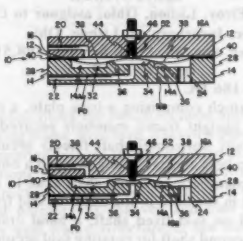
1. A flush valve comprising a valve body having a fluid inlet and a fluid outlet, a flexible valve sleeve provided in said body between said inlet and outlet, said flexible valve sleeve being integrally formed and comprising funnel-shaped inlet and outlet portions merging longitudinally inwardly toward the center of the sleeve, and a central valve portion which constitutes a longitudinal continuation of said outlet portion and is re-entrant in the inlet portion, said central valve portion being provided with a normally closed slit, an annular chamber formed in said body around said sleeve, a duct communicating said annular chamber with said inlet whereby fluid pressure in said chamber may normally compress said sleeve to prevent fluid flow therethrough to said outlet, a secondary chamber provided in said body downstream from said sleeve and communicating with said annular chamber, said secondary chamber having a pilot valve port communicating with said fluid outlet, a normally closed pilot valve member cooperating with said pilot valve port, and actuating means operable from the exterior of said body to open said pilot valve member, whereby fluid pressure in said secondary chamber and said annular chamber may be reduced and said flexible valve sleeve may be expanded by fluid pressure from said inlet to facilitate fluid flow through the valve.

3,936,029

PNEUMATIC AMPLIFIER HAVING A GAIN ADJUSTMENT MECHANISM INCORPORATED THEREIN

Robert O. Brandt, 600-E Forest Ridge Road, Garner, N.C. 27529

Filed Apr. 25, 1974, Ser. No. 464,126
Int. Cl.² F16K 31/145
U.S. Cl. 251—61.1 5 Claims



1. A fluid amplifier valve having a gain adjustment mechanism incorporated therein for adjusting the gain of various input pressure signals received by the valve, said amplifier valve comprising:

a. a valve body structure having a main internal chamber formed therein;

b. a pressure signal opening means formed within said valve structure for enabling fluid pressure signals to be transmitted into said main internal chamber;

c. a fluid supply inlet opening means formed within said valve body for enabling fluid from a supply to be transmitted into said main internal valve chamber;

d. a fluid supply exit opening means formed within said valve body structure for enabling the fluid supply transmitted into said main internal chamber to exit therefrom;

e. a thin imperviable member extending across said main internal chamber and supported about the outer portions thereof by said valve body structure so as to separate the fluid of said pressure signal from the fluid supply passing through said main internal chamber;

f. mounting means movably mounted in said valve structure; and

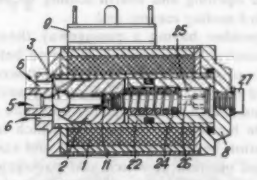
g. contact means operatively connected to said movable mounting means for engaging said imperviable member extending across said main internal chamber and varying the gain of said amplifier valve, whereby the gain of said amplifier valve may be selectively adjusted by moving said contact means relative to said valve structure such that the shape of the imperviable member within said main internal chamber is influenced thereby enabling the gain of said fluid valve to be selectively varied and adjusted by moving said contact means in order that the shape or contour of said imperviable member may change relative to said valve structure and give rise to a change in gain.

3,936,030

ELECTROMAGNETIC VALVE

Ernst Putschky, Reichenbach, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Division of Ser. No. 358,278, May 8, 1973, Pat. No. 3,876,177.
This application Oct. 9, 1974, Ser. No. 513,345
Claims priority, application Germany, May 8, 1972, 2222448
Int. Cl.² F16K 31/06
U.S. Cl. 251—129 4 Claims



1. A valve assembly comprising: first means defining a chamber; a ferromagnetic armature guided for movement in said chamber; a member in said chamber mounted on said armature, said member being adjustable in first and second directions to move said member in third and fourth directions, respectively, relative to said armature; a body mounted on said first means providing a valve seat having an inlet opening therethrough; a solenoid-like winding fixed relative to and around said first means in a position to cause, when energized, movement of said armature from a first position thereof to a second position thereof; and second means movable with said member to abut said valve seat and to close said inlet opening, abutment of said second means with said valve seat taking place when said member is in a predetermined position, the position of said armature relative to said valve seat when said abutment takes place being changeable by adjustment of said member, said first means defining a chamber which is cylindri-

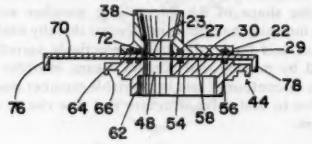
cal, said armature being cylindrical at least in part to slide in said cylindrical chamber, said member being one portion of a valve, said second means being integral with said member and being the remainder of said valve over said one portion thereof, said armature having at least a partially screw-threaded passageway, said passageway extending completely therethrough, said member including a set screw threaded into and rotatably in said passageway, said valve being located on said set screw at one end thereof near one end of said armature, the other end of said set screw having a construction for engagement with a first device to rotate the said set screw, said armature having a cylindrical axis, and third means pivoting said valve relative to and on said set screw about an axis approximately normal to said armature axis.

3,936,031

SELF-CONTAINED VACUUM ASPIRATOR

Richard M. Berman, Dresher, Pa., and Bernard Schwartz, Springfield, N.J., assignors to Alphamedics Mfg. Corporation, Levittown, Pa.

Filed Sept. 21, 1973, Ser. No. 399,535
Int. Cl.² F16K *51/00, 3/00;* **A61M** *1/00;* **A61B** *17/22*
U.S. Cl. 251—284 **6 Claims**



1. A valve assembly for selectively allowing the passage of fluid therethrough; said valve assembly comprising

a first member having an aperture therethrough, said first member having a first surface on which is positioned first sealing means surrounding said aperture and second sealing means surrounding said first sealing means;

a second member secured to said first member, said second member having an opening therethrough and a first surface on which is positioned third sealing means surrounding said opening and fourth sealing means surrounding said third sealing means; and

a slide member having a passageway therethrough, said slide member being movably mounted between said first surfaces of said first and second members and sealingly engaged on opposite sides thereof by said first, second, third and fourth sealing means, said slide member being movable between a first position which interrupts communication between said aperture and said opening and a second position in which said passageway establishes communication between said aperture and said opening to permit flow through said valve assembly; and

wherein said first and second sealing means comprise first and second sealing members received in channels provided in said first surface of said first member, and said third and fourth sealing means comprises third and fourth sealing members received in channels provided in said first surface of said second member; and

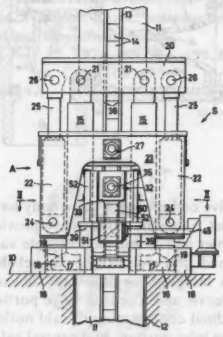
wherein a portion of said second sealing member is spaced from a corresponding portion of said first sealing member by a distance greater than the diameter of said passageway through said slide member, and a portion of said fourth sealing member is spaced from a corresponding portion of said third sealing member by a distance greater than the diameter of said passageway, said passageway through said slide member being sealingly located between said respective portions of said first, second, third and fourth sealing members when said slide member is located in its said first position.

3,936,032

APPARATUS WITH A WORKING PLATFORM AND ADJUSTABLE LEGS THEREFOR

Walter Waschulzik, Dulmen, and Maximilian Dyczek, Dortmund-Brechten, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Apr. 15, 1974, Ser. No. 461,217
Claims priority, application Germany, Apr. 19, 1973, 2319931
Int. Cl.² B66F *7/16*
U.S. Cl. 254—108 **14 Claims**



1. An apparatus comprising a platform, a plurality of legs for supporting the platform, each leg having a series of vertically-spaced reception recesses, a device for each leg for effecting relative movement between the leg and the platform, each device comprising support members generally upstanding relative to the platform, means for selectively locking the support members to the leg, each support member locking means including a carrier and a plunger slidably mounted within the carrier, the plunger being selectively enngageable in the recess of the leg, the support members having bracket guideways for supporting the carrier, the carrier being movable substantially vertically to a limited extent with relation to the bracket guideways, a carriage, means for selectively locking the carriage to the leg, each carriage locking means including a plunger slidably mounted within the carriage, the plunger being selectively engageable in the recesses of the legs, ram means for effecting relative movement between the carriage and the support members in the direction of the longitudinal axes of the latter, and means for connecting the support members to the platform for accommodating limited universal angular movement of the support members and hence of the device as a whole in relation to the platform.

3,936,033

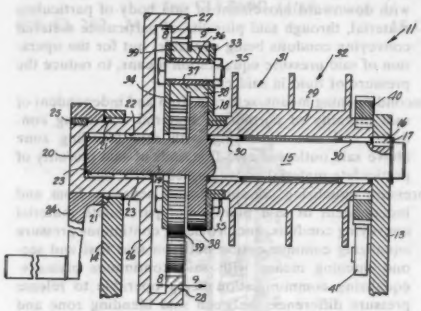
HAND WINCH

Robert C. McElroy, Lisbon, Ohio, assignor to Cable Climber Safety Devices Incorporated, Lisbon, Ohio

Filed Aug. 19, 1974, Ser. No. 498,519
Int. Cl.² B66D *1/04*
U.S. Cl. 254—186 HC **1 Claim**

1. A hand winch comprising a base plate, a pair of spaced apart parallel upright frame members secured to said base plate, a generally horizontal shaft fixedly secured to one of said frame members and extending through a bore in the other of said frame members, a second shaft axial to said first shaft and journalled in the bore in the other of said frame members and journalled on said fixed shaft, a hand crank fixedly secured to said second shaft for rotating said second shaft, a pair of cable drums mounted for rotation on said fixed shaft, planet gear means coupling said second shaft and said cable drums to rotate said cable drums upon rotation of said second shaft

at a speed substantially less than the speed of rotation of said second shaft, and means on said cable drums cooperating with



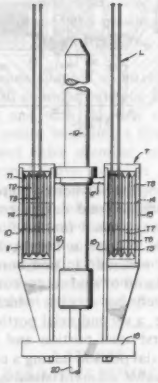
means on said one of said frame members for locking said cable drums against rotation in a pre-selected direction.

3,936,034

BALANCED HOIST APPARATUS

Edward Larralde, Santa Barbara, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Apr. 8, 1974, Ser. No. 458,657
Int. Cl.² B66D 3/04
U.S. Cl. 254—188 15 Claims



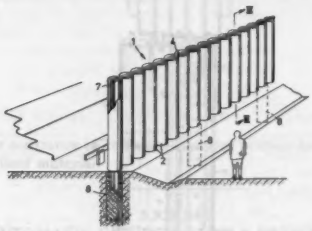
13. A traveling block for balanced hoist apparatus comprising a supporting frame structure, a set of a plurality of sheaves rotatably supported by said frame structure at one side of said supporting frame structure, a set of a plurality of sheaves by said frame structure at the being substantially spaced from the other of said plurality of sheaves and also being rotatably supported by said frame structure at the other side of said supporting frame structure, and load supporting means disposed between said sets of sheaves and carried by said frame structure in off-set relation to the center of said frame structure towards one of said sets of sheaves.

3,936,035

SOUND DAMPING CURTAIN WALL

Ake John Hugo Conrad Weimar, Larsbergsvagen 51, S-181 38 Lindigo, and Hans Hjalmar Gustafson, Tradgardsgatan 22, S-172 38 Sundbyberg, both of Sweden

Filed Apr. 3, 1974, Ser. No. 457,607
Claims priority, application Sweden, Apr. 6, 1973, 04851/73
Int. Cl.² F01N 1/10; E01F 15/00
U.S. Cl. 256—13.1 4 Claims



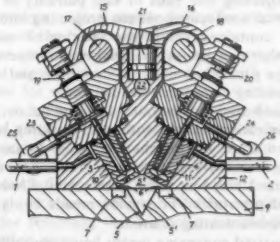
1. A sound damping curtain wall comprising a plurality of separate substantially empty tubular parallel damping elements arranged side by side being operable to acoustically damp sound, each damping element having flexible walls and two end portions with recesses, means for resiliently pressing the damping elements laterally against each other including a pair of spaced-apart generally vertical posts, connecting means extending along and operably received by the recesses of the damping elements and attached to the generally vertical posts.

3,936,036

MIXING DEVICE

Bernd Fries, Nuremberg, Germany, assignor to Demag Kunststofftechnik GmbH, Nuremberg, Germany

Filed Sept. 4, 1974, Ser. No. 503,117
Claims priority, application Germany, Sept. 14, 1973, 2346347
Int. Cl.² B01F 5/02
U.S. Cl. 259—4 R 9 Claims



1. A mixing device for mixing a plurality of components to provide a synthetic material, prior to a shape-imparting process, said device comprising a mixing chamber having chamber walls, a plurality of nozzles for feeding the components into the mixing chamber, said mixing chamber comprising a portion remote from and tapering away from said nozzles and the chamber walls of said portion intersecting at the lowest point of the mixing chamber, the nozzles being arranged so that their axes intersect at an angle, the point of intersection of said axes lying within the mixing chamber whereby jets ejected from said nozzles impinge upon one another immediately above said lowest point of the mixing chamber, and an

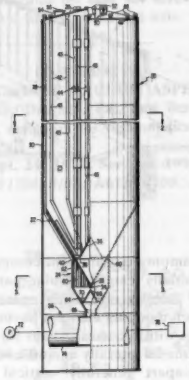
outlet from said mixing chamber to conduct away the resulting synthetic material.

3,936,037

VENTED GRAVITY BLENDER

James H. Leonard, Jr., Houston, Tex., assignor to Allied Industries, Inc., Houston, Tex.

Filed May 22, 1974, Ser. No. 472,510
Int. Cl.² B01F 5/00
U.S. Cl. 259—180 **2 Claims**



1. A gravity blender for particulate materials comprising:

a container for the particulate materials, said container having a container wall and a closed top;

a plurality of conduits disposed substantially within said container and operable to convey particulate materials downward under the influence of gravity, each of said conduits having one end projecting downwardly through said container wall and each of said conduits being provided with at least one lateral opening operable to receive particulate materials from said container;

a blending chamber operable to receive particulate material from said projecting one ends of said plurality of particulate material conveying conduits, with

said projecting one ends of said plurality of particulate material conveying conduits projecting into a blending zone contained within the interior of said blending chamber and having material outlets operable to discharge particulate material thereinto, and

said blending zone being pressurized;

a pressurized discharge opening disposed below, and in fluid communicating relation with, said blending zone;

pressurized conveying means connected to said discharge opening for receiving particulate material therefrom; said pressurized blending zone, pressurized discharge opening, and pressurized conveying means being in mutual, fluid communicating relation;

said pressurized conveying means being operable to convey particulate material away from said pressurized discharge opening and transmit pressurized, particulate material conveying fluid therethrough operable to pressurize said pressurized discharge opening and said pressurized blending zone; and

pressure equalization means for relieving pressure differences between said blending zone and said container which oppose gravity movement of particulate materials through said plurality of particulate material conveying conduits;

said pressure equalization means being separate from and operationally independent of said plurality of particulate material conveying conduits and including

first opening means, separate from and independent of said plurality of particulate material conveying conduits, and communicating with a cavity located adjacent said closed top of said container and above a body of particulate material contained within said container, with downward movement of said body of particulate material, through said plurality of particulate material conveying conduits being operable, but for the operation of said pressure equalization means, to reduce the pressure of fluid in said cavity,

second opening means, separate from and independent of said plurality of particulate material conveying conduits, and communicating with said blending zone above said outlets of said first ends of said plurality of particulate material conveying conduits, and

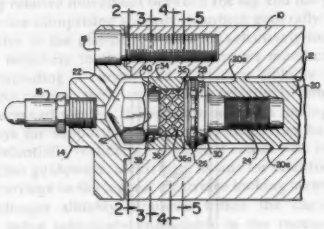
pressure equalizing conduit means, separate from and independent of said plurality of particulate material conveying conduits, and providing continuous pressure equalizing communication between said first and second opening means with said continuous pressure equalizing communication being operable to release pressure differences between said blending zone and said cavity located above said body of particulate material.

3,936,038

MIXER FOR PLASTIC INJECTION MOLDING MACHINE

Bernie A. Olmsted, East Longmeadow, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Aug. 14, 1974, Ser. No. 497,336
Int. Cl.² B29F 1/04
U.S. Cl. 259—191 **11 Claims**



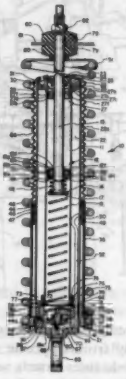
1. A device for mixing the plasticized ingredients in a plastic injection molding machine, said device comprising a barrel with an elongated bore, a head for the forward end of said barrel and adapted to receive a nozzle, a screw conveyor slidably and rotatably mounted in said bore, a torpedo body carried at the forward end of said screw conveyor and having a first axial portion defining a collar which has a forwardly facing annular surface, a second axial portion of said torpedo body adjacent said first axial portion and located forwardly thereof, said second axial portion having a cylindrical external surface, an annular valve element slidably received in said bore and having a generally rearwardly facing annular valve surface, engageable with said annular forwardly facing surface to define a valve closed position, said internal cylindrical surface of said valve element providing a sliding fit with said cylindrical external surface of said second axial portion at least one of said cylindrical surfaces defining two series of criss-crossing generally helically configured grooves opposite in hand and providing a pattern of intersecting passageways in cooperation with the adjacent other cylindrical surface for dividing and recombining the flow of plasticized ingredients through said second axial portion, and means carried by said torpedo body for defining a stop for said valve element to define a valve open position.

3,936,039

LOAD-LEVELLING SHOCK ABSORBER

Paul G. McKinnon, Brigham City, Utah, assignor to Tropic Industries, Inc., Salt Lake City, Utah

Filed June 21, 1974, Ser. No. 481,887
Int. Cl.[2] B60G 11/56
U.S. Cl. 267—34 15 Claims



1. A load leveller for use with vehicles and the like comprising

a ride control cylinder;

an oil reservoir;

a lift cylinder having a seal member fixed relative to the oil reservoir and a movable seal member;

displacement means adapted to reciprocate into and out of said ride control cylinder;

a main spring having one end carried by the movable member of the lift cylinder and another end fixed to the displacement means exteriorly of the ride control cylinder; and

control valve means adapted to interconnect the oil reservoir with the lift cylinder between the fixed and movable seal members and with the ride control cylinder, said control valve means including a fixed body member and a movable spool valve member, means resiliently connecting the spool valve member to the displacement means, said spool valve member having a restriction therethrough whereby oil moves through said restriction as said spool valve member is moved in response to movement of the displacement means, said oil flow through said restriction regulating the speed of movement of the spool valve member and preventing corresponding travel of the displacement means and spool valve member.

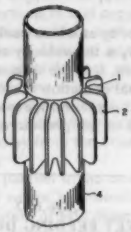
3,936,040

RESILIENT BUMPER

Richard Allen Wilson, and William E. Foster, both of Pittsburgh, Pa., assignors to Magee Plastics Company and Mitchell Plastics, Inc., both of Pittsburgh, Pa., part interest to each

Filed Feb. 14, 1974, Ser. No. 442,756
Int. Cl. F16f 7/12
U.S. Cl. 267—140 11 Claims

1. A bumper for attachment to a surface to be protected against collision, comprising a base portion having two integral parts of substantially equal length extending at right angles to each other for attachment to a corner of an object to be protected and a plurality of integral upstanding fins which are parallel and which extend at an angle of less than 90° from said base portion, also which fins are so closely spaced apart that an object colliding therewith will cause the fins to flex and to contact each other progressively so as to offer progressively



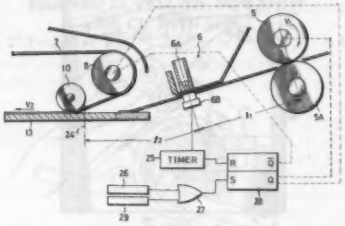
greater resistance to collision, said base portion and fins being of resilient material.

3,936,041

AUTOMATIC ORIGINAL SUPPLY DEVICE FOR ELECTRONIC COPYING APPARATUS

Toshio Shiina, Yokohama; Masao Yaejima, Sendai; Tadayuki Sekiya, and Toshiro Bando, both of Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1974, Ser. No. 536,295
Claims priority, application Japan, Dec. 26, 1973, 48-143935
Int. Cl.[2] B65H 7/14
U.S. Cl. 271—4 2 Claims



1. An automatic original supply device for electronic copying apparatus of the type comprising:

an original standby section including an original support tray and separation and supply means with a driven supply roller for supplying one original document after another from a pile of originals on said original support tray;

an original conveying and holding section including a belt for conveying to a predetermined illumination position an original supplied by the original separation and supply means and holding the same in said position; and

an original ejection section including original delivery means for removing the original processed through the illumination step;

wherein the improvement comprises:

original detection means interposed between the separation and supply means and said belt for detecting the passage of the trailing end of a first original;

timer means actuated in response to the detection of the trailing end of said first original for stopping said belt after a predetermined lapse of time such that said first original is in said predetermined illumination position and for interrupting the operation of said original separation and supply means to cause said next original to stand by;

overrunning clutch means for permitting said supply roller to rotate at a velocity higher than its driven velocity; and

wherein the following relations hold:

$$\frac{l_1}{V_1} > \frac{l_1 + l_2}{V_2}$$

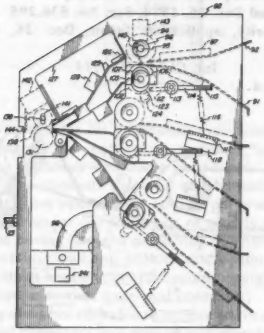
where V_1 is the velocity at which each original is supplied by said supply roller, V_2 is the velocity at which each original is conveyed by said belt, l_1 is the distance between said supply roller and the original detection means, and l_2 is the distance between the original detection means and the trailing end of an original disposed in the predetermined illumination position.

3,936,042

SHEET FEEDING DEVICES

Vernon J. Smith, Tewkesbury, England; Howard M. Smith, Venray, Netherlands; Bernard F. Page, Coleford, and Laurence G. Miller, Drybrook, both of England, assignors to Rank Xerox Ltd., London, England

Filed Nov. 19, 1973, Ser. No. 417,016
Int. Cl.² B65H 1/28, 3/52
U.S. Cl. 271—9 2 Claims



1. A sheet feeding device comprising:

a plurality of support surfaces each for supporting a stack of sheets;

a sheet separating device for each support surface, the sheet separating device comprising a shaft, a plurality of first rollers mounted on the shaft symmetrically about the center of the shaft, a plurality of second rollers mounted opposite the first rollers for rotation about an axis substantially parallel to the shaft, means for supporting the shaft for movement towards and away from the axis, means acting on the center of the shaft for biasing the shaft toward the axis, and means for driving one of the plurality of rollers to forward a sheet between the nip of the roller;

means for each support surface for feeding the top sheet of the stack to the corresponding sheet separating device;

a single sheet conveyor;

guide means for guiding sheets from all the sheet separating devices to the single sheet conveyor; and,

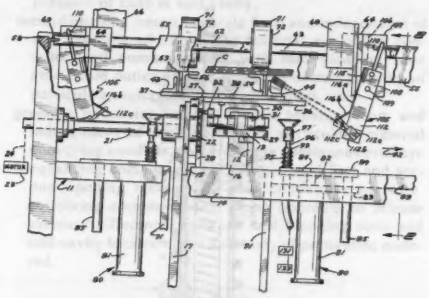
sheet sensing means located downstream of the single sheet conveyor for stopping operation of the sheet separating device and the sheet forwarding device of one of the support surfaces during passage of a sheet past the sheet sensing means.

3,936,043

FLAP PULL DOWN CASE STRIPPING APPARATUS

Gaylerd Lieder, Minneapolis, and Philip G. Rawlins, St. Paul, both of Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed July 26, 1974, Ser. No. 492,223
Int. Cl.² B65H 3/26
U.S. Cl. 271—14 18 Claims



1. For removing a case having a body and flaps extending transversely outwardly from opposite sides of the body and joined thereto along fold lines from a vertical stack of cases in horizontal, flat folded conditions, a frame, longitudinally elongated slide means on the frame for supporting the stack of cases at the bodies thereof, means mounted on the frame for retaining the cases in the stack in generally vertical alignment while permitting the lowermost case of the stack to be slid longitudinally forwardly along the slide means from beneath the stack, means mounted on the frame for bending the lower transversely opposite flaps of the lowermost case in the stack downwardly at a preselected angle on each side of the body relative the body and retaining the bent down flaps in the bent condition while permitting the lowermost case to be slide from beneath the stack along the slide means, the bending and retaining means including operable gripper means on each transverse side of the slide means for grippingly engaging the adjacent flap, thence bending the adjacent flap to a preselected angle relative the body, and then release the adjacent flap, means mounted on the frame for retaining the adjacent flaps that have been bent to the preselected angles by the gripper means at the preselected angles while permitting the bent flaps to move longitudinally forwardly relative thereto, stripper means movably mounted on the frame for moving the lowermost case along the slide means from beneath the stack after the lowermost flaps have been bent downwardly, said stripper means including means for abuttingly engaging the lowermost case and moving the lowermost case forwardly along the slide means, and means for operating the gripper means to grip the adjacent flaps, bend the flaps and thence release the bent flaps after the flaps have been bent to the preselected angles, and moving the stripper means to move the abutting means into abutting engagement with the lowermost case in the stack to move it forwardly after the gripper means has released the bent flaps.

3,936,044

ADJUSTABLE SHEET GUIDE

William E. Kramer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 18, 1974, Ser. No. 515,935
Int. Cl.² B65H 3/06, 1/04
U.S. Cl. 271—122 9 Claims

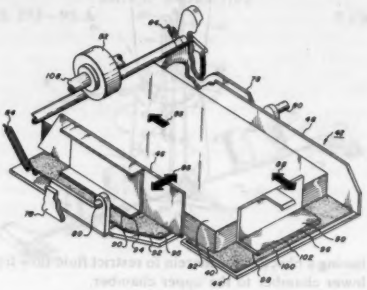
1. An apparatus for aligning a stack of sheets, including:

means for supporting the stack of sheets;

guide means mounted movably on said supporting means and having at least one generally planar, substantially

vertical surface opposed from the edge of the stack of sheets;

a first pad secured to said supporting means, said first pad having a plurality of bristles extending in an outwardly direction defining an acute angle relative to the surface thereof; and



a second pad secured to said guide means, said second pad having a plurality of bristles extending in an outwardly direction defining an acute angle relative to the surface thereof in a direction substantially parallel to the bristles of said first pad so that the bristles of said first pad interleaf with the bristles of said second pad retarding frictionally the relative movement between said guide means and said supporting means.

3,936,045

SHEET STRIPPING DEVICE FOR COPYING APPARATUS

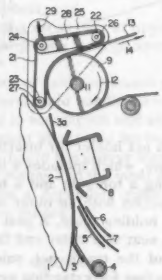
Kenzo Ariyama, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1974, Ser. No. 443,081

Claims priority, application Japan, Feb. 26, 1973, 48-24365[U]; May 31, 1973, 48-64720[U]

Int. Cl.[2] B65H 29/54

U.S. Cl. 271—174 6 Claims



1. A sheet stripping device for copying apparatus provided with a drum adapted to rotate continuously in one direction, and a sheet feed device for feeding one copy sheet after another to a specific zone of the peripheral surface of the rotating drum, said sheet stripping device comprising the combination of:

a. a sheet pick-off member arranged near one marginal portion of the specific zone of the peripheral surface of the drum and including:

i. a base portion maintained in pressing engagement with said one marginal portion of said zone and with which one marginal portion of each copy sheet fed by said sheet feed device to the drum is brought into pressing engagement; and

ii. a forward end portion whose surface is increasingly spaced from the peripheral surface of the drum beyond said zone in the direction of drum rotation to pick off said marginal portions of said copy sheets from engagement with the drum surface beyond said zone;

b. sheet strip-off means disposed adjacent to and spaced from the surfaces of said drum and said sheet pickoff member for catching one marginal portion of the leading end portion of each copy sheet picked off the peripheral surface of the drum by said sheet pick-off member and for pulling the sheet away from the drum, said sheet strip-off means comprising:

i. a shaft disposed parallel to the center axis of said drum and adapted to rotate in a direction opposite to the direction of rotation of said drum;

ii. a guide roller supported on said shaft for rotation therewith; and

iii. an endless belt having one portion maintained in pressing engagement with a portion of the peripheral surface of the guide roller, said guide roller and said endless belt cooperating with each other to hold therebetween one marginal portion of the copy sheet; and

c. one-way rotation clutch means interposed between said guide roller of said sheet strip-off means and the shaft supporting said guide roller, for permitting said guide roller to rotate relative to said shaft in a direction in which each sheet moved by said guide roller is conveyed.

3,936,046

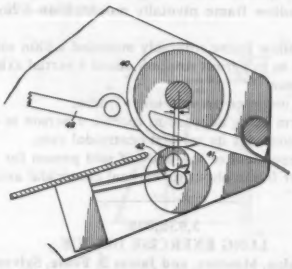
FRONT AND SIDE SHEET REGISTERING APPARATUS

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 527,117

Int. Cl.[2] B65H 9/04

U.S. Cl. 271—250 4 Claims



1. An apparatus for feeding and separating individual sheets from a stack of sheets including:

separating means disposed adjacent the forward edge of the stack;

a side register edge adjacent the side of the stack extending forwardly thereof, said separating means being adapted to separate sheets seriatim from the stack and drive each separated sheet in a forward and sideward direction against said register edge to side register each sheet thereagainst; and

a plurality of take-away roll pairs disposed downstream of said separating means, each of said take-away roll pairs comprising a driven roll and an idler roll, all of said driven rolls of said roll pairs being mounted on a common drive shaft, said drive shaft being disposed perpendicular to the direction of sheet travel, the axis of the idler roll adjacent said side register edge being positioned in advance of the axes of the remaining idler rolls, said roll pairs being adapted for contacting the lead edge of each sheet for forwarding each sheet away from said separating means,

positioning of the axis of the idler roll adjacent said side register edge in advance of the axes of the remaining idler rolls causing the roll pair adjacent said register edge to contact the lead edge of each sheet slightly in advance of the remainder of said take-away roll pairs, thereby positively forcing the trailing edge of the sheet against said side register edge to prevent inducement of skew by said take-away roll pairs.

3,936,047

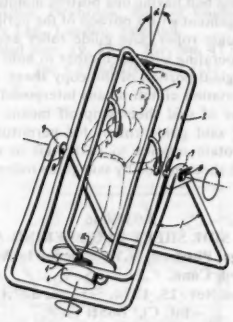
BODY PHYSICAL CONDITIONING MACHINE

William E. Brandt, 12567 Saratoga Creek, Saratoga, Calif. 95070, and Allen L. Clark, 1654 Sundown Lane, San Jose, Calif. 95127

Division of Ser. No. 818,173, March 24, 1969, now Pat. No. 3,581,739. This application Mar. 10, 1971, Ser. No. 122,754

Int. Cl.[2] A63B *21/22*; G09B *9/08*

U.S. Cl. 272—57 A 6 Claims



1. A body physical conditioning machine comprising:

an outer hollow frame pivotally mounted on a horizontal axis;

an inner hollow frame rotatably mounted within said outer frame so as to permit rotation about a vertial axis of said inner frame;

a platform mounted on said inner frame;

said platform being adapted to receive a person in a standing position over its vertical centroidal axis;

means independent of the body of said person for rotating said inner frame about its vertical centroidal axis.

3,936,048

LUNG EXERCISE DEVICE

Glenn H. Dunlap, Maumee, and James B. Foote, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 8, 1975, Ser. No. 539,292

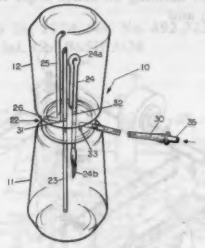
Int. Cl.[2] A63B *23/00*

U.S. Cl. 272—57 F 5 Claims

1. In a device for forced expiration exercise wherein liquid is blown between interconnecting compartments to achieve respiratory stimulation, the improvement comprising:

a chamber partitioned by a septum into an upper compartment and a lower compartment said upper compartment being vented to the ambient and said lower compartment being interconnected to an external blow tube, said compartments communicating with each other by means of a liquid transfer tube passing through said septum for transferring blown liquid from said lower compartment to said upper compartment, said transfer tube extending to near the bottom of lower compartment and to near the top of said upper compartment; and

a siphon tube for siphoning liquid form said upper compartment to said lower compartment, passing through said septum, said siphon tube having an inverted U-bend therein which is positioned in said upper compartment and extends into said upper compartment a lesser distance than said liquid transfer tube, said siphon tube



having a check valve therein to restrict fluid flow from the lower chamber to the upper chamber.

3,936,049

TABLE TENNIS NET HOLDER

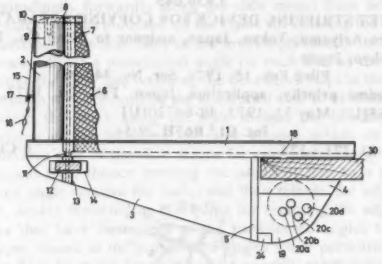
Rudolf Neumann, Breglink, Nubel, Germany, assignor to Heinz Kettler Metallwarenfabrik, Ense-Parsit, Germany

Filed June 13, 1974, Ser. No. 478,959

Claims priority, application Germany, June 13, 1973, 2330003

Int. Cl.[2] A63B *39/00*

U.S. Cl. 273—30 8 Claims



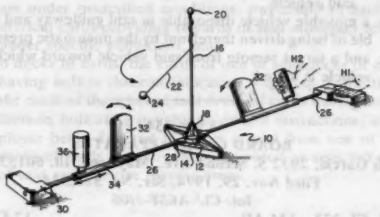
1. A table tennis net holder for insertion into a transverse gap of a tennis table, which includes a longitudinally shaped holding plate having a top side and a bottom side and also having an outer section with an outer end face forming the outer end of said holding plate, a post extending upwardly from said top side near said outer end face for receiving and holding one end of the tennis net, said holding plate also having an inner section for extending across a portion of the width of a tennis table, abutment means arranged between said outer section and said inner section for abutment with one side of a tennis table to thereby limit the overlapping of a tennis table by said inner section, first and second web means respectively arranged below said outer and inner sections of said holding plate and extending at least approximately in a plane perpendicular thereto, supporting means extending through said second web means, and clamping means comprising at least one eccentrically operable member supported by said supporting means for pressing with camming action against an adjacent tennis table section when said holding plate occupies a desired effective position fastened on a tennis table.

3,936,050

TETHER BALL APPARATUS WITH ATTACHED STRIKING MEMBERS

James R. Hornsby, Jr., 6239 Edgewater Drive, Orlando, Fla. 32810

Filed Aug. 21, 1974, Ser. No. 499,280
Int. Cl.[2] A63B 71/02
U.S. Cl. 273—95 A 7 Claims



1. A tether ball game comprising
a vertically upstanding pole;
a ball;
a string connected between said ball and the upper end of said pole;
a plurality of contact members each having at least one flat side surface;
mounting means for said contact members,
said mounting means being horizontally axially slidable toward and away from said pole to move said contact members to a position where the flat side surface thereof can contact against said ball,
said mounting means also being rotatable about said horizontal axes to swing said contact members until the flat side surfaces thereon contact said ball and propel the same in a rotary motion about said pole to cause said string to wrap around said pole,
said mounting means also being manually operable and includes a handle member which can be manually gripped to accomplish said axial sliding and said rotational movement about said horizontal axes,
rod means extending horizontally outward from said pole, said rod means serving as the said mounting means for said contact members; and
a planar board having cross bars at opposite ends thereof, said rod means projecting through apertures in said cross bars;
wherein that portion of said rod means projecting beyond said cross bars forms said handle member which can be manually gripped to accomplish said axial sliding and said rotational movement about said horizontal axes, and
wherein said planar board has groove means formed therein beneath said rod means and the inner end of each of said rod means carries a depending guide member slidable within said groove means.

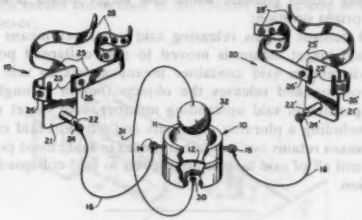
3,936,051

TETHERED-BALL GAME HAVING SUSPENDED RECEIVING MEANS

Wilmer David Walker, Jr., 1316 Sharon St. NW., Atlanta, Ga. 30314

Filed Oct. 18, 1974, Ser. No. 515,985
Int. Cl.[2] A63B 71/02
U.S. Cl. 273—95 A 1 Claim

1. A tethered-ball game apparatus wherein two players are required to cooperate to achieve the object of the game, said apparatus including a receiving member comprising a cup having side walls and a bottom, a tossing member comprising a ball of such size as to be receivable within said receiving means, suspension means for suspending said receiving member between said two players, said suspension means comprising a first flexible suspension line having one of its ends fixed to one side of said receiving member above the center of gravity of said receiving member and the other of its ends releasably fixed to one of said players, and a second flexible suspension line having one of its ends fixed to the opposite side of said receiving member above the center of gravity of said receiving member and the other of its ends releasably



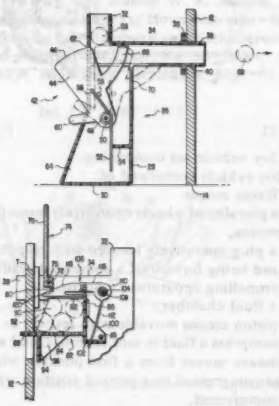
fixed to the other of said players, and a flexible tether, one end of said flexible tether being fixed to said bottom of said receiving member, said tossing member being carried at the opposite end of said flexible tether, said flexible tether and said tossing member being so constructed and arranged that said tossing member will assume a pendulum-like motion upon swinging of said receiving member on said first suspension line and said second suspension line.

3,936,052

PROJECTOR AND DISPENSER ACTIVATED WHEN ALL TARGETS ARE HIT

James R. Hornsby, Jr., 6239 Edgewater Drive, Orlando, Fla. 32810

Filed Nov. 18, 1974, Ser. No. 524,737
Int. Cl.[2] F41J 7/00; A63B 71/00
U.S. Cl. 273—101 21 Claims



1. An amusement device comprising:
an upstanding member having an aperture formed therein;
container means movably mounted behind said upstanding member and being adapted to contain objects,
said container means being movable from a closed position where objects are retained therein to an open position where objects are released through said aperture in said upstanding member;
target means movably mounted adjacent to said upstanding member for movement from an upright position where said target means projects above said upstanding member

to a collapsed position where said target means is no longer upright;

projectile firing means for launching projectiles at an opponent's target means to knock said target means from said upright position to said collapsed position; and

control means engageable with said target means and said container means;

said control means serving to retain said container means in said closed position while said target means is in said upright position;

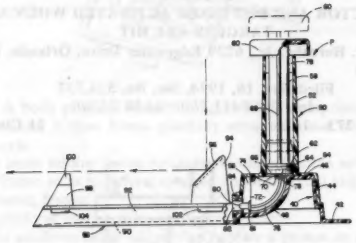
said control means releasing said container means when said target means is moved to said collapsed position whereupon said container means moves to said open position and releases the objects therein through said aperture in said upstanding member, said target means including a plurality of targets and wherein said control means retains said container means in said closed position until all of said targets are moved to said collapsed position.

3,936,053

TOY VEHICLE TARGET GAME

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe, both of Northridge, Calif.

Filed Feb. 10, 1975, Ser. No. 548,695
Int. Cl.² A63H *17/00*
U.S. Cl. 273—108 **14 Claims**



1. A toy vehicle set comprising:

a. a toy vehicle comprised of:

1. frame means
2. a plurality of wheels operatively mounted on said frame means,
3. a plug operatively located with respect to said vehicle and being formed of a somewhat resilient material,

b. a propelling apparatus comprised of:

1. a fluid chamber,
2. piston means movable with respect to said chamber to compress a fluid in said chamber, and where said piston means moves from a first position where said fluid is uncompressed to a second position where said fluid is compressed,
3. a nozzle operatively communicating with said chamber and being sized to removably accept said plug in fluid-tight engagement,
4. shiftable actuating means operatively mounted in said chamber and being shiftable when said piston means shifts to the second position,
5. said actuating means being located to be shifted to engage said plug when said piston means reaches said second position and thereby break the seal between said plug and said nozzle to permit the compressed fluid to propel said vehicle.

8. A toy vehicle target game comprising:

a. a propelling apparatus comprised of:

1. a guideway
2. a pneumatically operable drive means located in relation to said guideway for driving a vehicle under pneumatic pressure,
3. sighting means disposed in operative relationship to said guideway to guide a vehicle toward a target,
4. mechanical release means for initially releasing said vehicle to enable said drive means to propel the aforesaid vehicle,

b. a movable vehicle disposable in said guideway and capable of being driven therefrom by the pneumatic pressure,

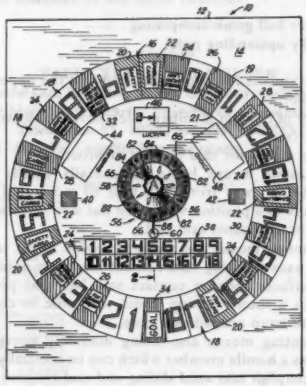
c. and a target remote from said vehicle toward which said vehicle is aimed.

3,936,054

BOARD GAME APPARATUS

Luis Garcia, 2032 S. Second Ave., Maywood, Ill. 60153

Filed Nov. 29, 1974, Ser. No. 528,334
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 AD **12 Claims**



1. A board game apparatus for a plurality of players comprising in combination

a playing board having a continuous main course, said main course being divided into a plurality of adjacent playing areas, a portion of said plurality of main course playing areas having penalties, rewards, and instructions associated therewith to which said players must respond, the remaining portion of said plurality of main course playing areas being provided with numerical indicia thereon, said playing areas being randomly arranged to form said main course, said board further including differently colored playing areas disposed without said main course, a plurality of secondary playing areas having consecutive numerical indicia thereon disposed without said main course, each said secondary playing area corresponding to one of said main course playing areas having numerical indicia thereon, said playing board additionally including a generally centrally disposed dial indicator rotatably affixed thereon,

said rotatable dial indicator having a plurality of areas, selected ones of which have numerical indicia thereon corresponding to the numerical indicia provided on said main course playing areas, said areas having colors corresponding to said differently colored playing areas,

said rotatable dial indicator being capable of rotating and indicating a chance selected one of a plurality of numerical quantities when coming to rest,

a plurality of distinctive tokens constituting playing pieces, one of said tokens being utilized by each of said players in playing said game,

monetary tokens for payment of rewards and penalties by players whose distinctive token lands on a main playing area having such instructions thereon,

wagering tokens for placement on said secondary playing areas and said colored areas to indicate the areas selected and the amount wagered,

a plurality of cards, each said card having a numerical indicia thereon corresponding to one of said main path numerical indicia, said cards being acquired by said players under prescribed conditions, ownership of said numerical cards providing rewards of said monetary tokens under specific conditions, and

two decks of cards, the cards of one of said decks of cards having indicia thereon indicating wagering instructions, the cards of the other of said decks of cards having indicia thereon indicating penalty or reward instructions, and a player being directed to select a card from one of said decks of cards by instructions provided on selected ones of said main course playing areas.

3,936,055

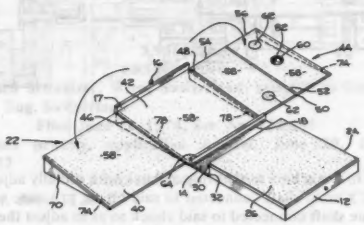
GOLF PRACTICE DEVICE

Rocco A. Scott, Burbank, Calif., assignor to Joseph B. Michaelson, North Hollywood, Calif.

Filed Dec. 11, 1974, Ser. No. 531,755

Int. Cl.² A63B *69/36, 67/02*

U.S. Cl. 273—176 H **9 Claims**



1. A portable, storable golf shot practice stage comprising a generally rectangular frame, a first side panel having a grass simulative playing surface, a second side panel having a grass simulative playing surface, a third side panel perimetrically fixed to one side of said frame and opposite said first and second panels, said first panel being attached to said frame in out-folding relation to upwardly expose its playing surface in the playing configuration of the stage; said second and third side panels cooperating to define with the frame a box-like cavity circumscribed by the frame, and enclosed by said second and third panels, and panel support means comprising plural thin, elongated, wedge-shaped members; said first side panel carrying retaining slots sized to frictionally retain said support members to thereby define the angular relation of said first panel to the frame horizontal plane.

3,936,056

SPINDLE DEPRESS/BRAKE MECHANISM

Forrest Wesley Breyfogle, III, Austin, and James Dudley Bruer, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,351

Int. Cl.² G11B *25/04, 3/62*

U.S. Cl. 274—9 B **3 Claims**

1. In a disc dictation machine having a loader carrier for effecting a disc change cycle by ejecting a first disc from a record/playback station into an unload station and transferring a second disc from a load station into the record/playback station, apparatus for disengaging a disc in the record/playback station during the disc change cycle comprising:

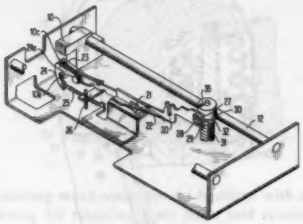
a spindle;

a pivotally mounted bellcrank having one end thereof shaped for operatively engaging said spindle for depression thereof;

cam means integral with the second end of said bellcrank;

a first surface integral with said loader carrier for engaging said cam means and rotating said bellcrank to depress said spindle;

latch means connected to the second end of said bellcrank lever;



spring means connected to said latch means for actuation thereof to latch said bellcrank in the spindle position;

a second surface integral with said loader carrier for engaging said latch means for unlocking thereof to release said spindle;

spring means connected to said bellcrank lever for biasing said bellcrank lever out of contact with said spindle; and

adjustable stop means attached to said second end of said bellcrank lever for inhibiting the motion of said bellcrank lever at a preselected non-spindle depression position.

3,936,057

SHAFT SEALS

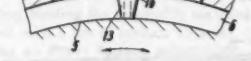
Gerhard W. H. Walter, and Günter W. E. Pietsch, both of Hamburg, Germany, assignors to Howaldtswerke - Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Germany

Filed Aug. 10, 1973, Ser. No. 387,243

Claims priority, application Germany, Aug. 11, 1972, 2239570

Int. Cl.² F16J *15/16*

U.S. Cl. 277—59 **21 Claims**



1. A device for improving circulation of a liquid lubricant comprising:

a. a rotatable member;

b. two axially spaced sealing rings mounted on said rotatable member, said rotatable member and said sealing rings forming a chamber in which the lubricant flows;

c. a stationary deflector element having one end resting on the periphery of said rotatable member, said one end being positioned between and spaced apart from said sealing rings to provide a flow path for lubricant between said deflector element and said sealing rings; and

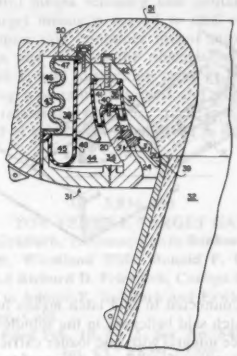
d. means, surrounding said rotatable member, for carrying said sealing rings and for supporting said deflector element between said sealing rings.

3,936,058

TRANSVERSE STIFFNESS AUGMENTATION BEARING

Thomas S. Clark, Monte Sereno, and Hugh M. Reynolds, San Jose, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 12, 1974, Ser. No. 505,430
Int. Cl.² F02K 1/24
U.S. Cl. 277—88 8 Claims



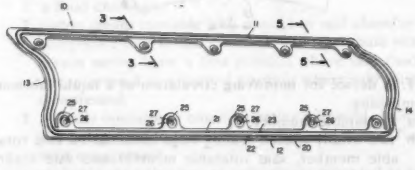
1. In a universal joint having 2 spaced-apart members to be connected together for relative axial and angular movement, an annular plug affixed to one of said members, an annular fluid-filled flexible membrane in the space between said plug and the other member, means attaching the central wall portion of said membrane to said plug, whereby relative movement of said plug effects movement of said membrane to provide a fluid bearing rolling seal between said plug and the surface of said other member, the surfaces of said membrane defining convolute rolling surfaces, and spaced tabs affixed to said plug and acting as transverse stiffness augmentation bearings for maintaining a minimum distance between said annular plug and said other member.

3,936,059

SEALING BOUNDARY GASKET FOR COMPRESSION BETWEEN FLANGED PORTIONS OF TWO MATING METAL MEMBERS

Alexander L. Gordon, Worcester, Mass., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 402,994, Oct. 3, 1973. This application Mar. 21, 1975, Ser. No. 560,571
Int. Cl.² B65D 53/06; F16J 15/02
U.S. Cl. 277—166 5 Claims



1. A sealing boundary gasket for compression between flanged portions of two mating metal members each having two longitudinal side portions that are flat but lie in different planes and end portions that join said side portions, comprising

a one-piece integrally molded elastomeric configuration of homogeneous composition throughout having two lengthwise strip portions that are generally planar and two end strip portions,

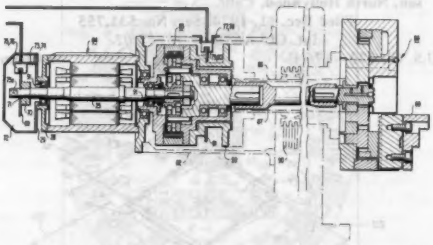
said two longitudinal strip portions including, as integral portions thereof and of the same homogeneous composition, series of inwardly projecting flexible portions for fully encircling bolts and for lying in a different plane from their adjacent strip portion and gasketing around them, each said flexible portion having a bolt-encircling rib for each bolt completely surrounding a bolt opening and being wedge-shaped so that each bolt-encircling rib has a highest portion leading smoothly to a diametrically opposite lowest portion, so that the load is substantially uniform around each bolt-encircling rib.

3,936,060

MEANS FOR DETECTING OPENING DEGREE OF CLAWS OF AN ELECTRICALLY DRIVEN MACHINE TOOL CHUCK

Kenichi Hirao, Kawasaki, Japan, assignor to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Aug. 7, 1974, Ser. No. 495,468
Claims priority, application Japan, Aug. 8, 1973, 48-93331[U]
Int. Cl.² B23B 31/02
U.S. Cl. 279—1 H 5 Claims



1. In a machine tool having a chuck with radially adjustable jaws, a main shaft connected to said chuck to rotate same, a torque shaft connected to said chuck so as to adjust the radial position of said jaws, a motor having an output shaft and operatively connected to said torque shaft to cause same to rotate with respect to said chuck to cause the movement of said jaws so as to adjust the clamping diameter of the jaws, the improved means for detecting the degree of opening of said jaws comprising:

a. a first detecting means operated by said motor output shaft for detecting the number of revolutions and direction of rotation of said motor output shaft;

b. a second detecting means operated by said main shaft for detecting the number of revolutions and direction of rotation of said main shaft;

c. counting means connected to said first and second detecting means to compare the difference between the number of revolutions of said motor output shaft and said main shaft, with a preset value and generate an output signal when said difference is not equal to said preset value; and

d. means connecting said counting means output signal to said motor such that said motor adjusts said chuck jaws whenever said counting means generates an output signal.

3,936,061

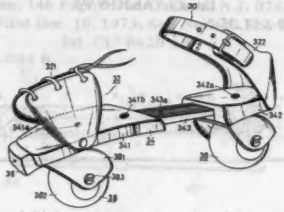
ROLLER SKATE

Nobuhito Wada, Tokyo, Japan, assignor to Mahmût Starkow, Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,397
Int. Cl.² A63C 17/06
U.S. Cl. 280—11.23 3 Claims

1. A roller skate, comprising a support, two rotary elements each having a substantially spherical configuration, means for rotatably mounting each of said elements on said support along the longitudinal axis of said support, said mounting means comprising a bolt-nut assembly and each of said rotary

elements having a central through bore, the bolt of said bolt-nut assembly extending through said bore to rotatably mount each of said elements, each of said rotary elements comprising a substantially spherical body formed with said central bore



and bearing means inserted in said bore, said body comprising a synthetic material and said bearing means being comprised of an oilless graphite-containing alloy, said body being laminated and having an inner layer comprised of ABS resin and an outer layer comprised of rubber means.

3,936,062

SKI BINDING

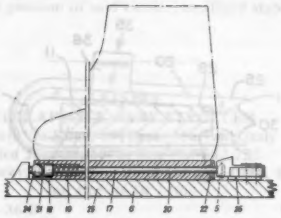
Gottfried Schweizer, Wien, Switzerland, assignor to Gertsch AG, Zug, Switzerland

Filed June 12, 1974, Ser. No. 478,585

Claims priority, application Austria, June 29, 1973, 5785/73

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 D 4 Claims



1. In a ski binding arrangement having at least one fitting on a ski boot sole and one binding part having spring-loaded holding parts mounted on a ski and adapted to engage said fitting, the improvement comprising a push rod reciprocally mounted in said ski boot sole, said fitting being mounted on said push rod, resilient means for resiliently biasing said fitting into a retracted non-use position in said ski boot sole when said ski boot sole is free of engagement with said ski so that said fitting will not be extended from said ski boot sole during a use of the ski boot away from said ski, and attachment means mounted on said ski and spaced from said binding part for pushing said push rod against the urging of said resilient means to push said fitting out from said ski boot sole to a position of use when said ski boot sole engages said ski between said attachment means and said binding part.

3,936,063

RETAINING MECHANISM FOR SKI BINDINGS

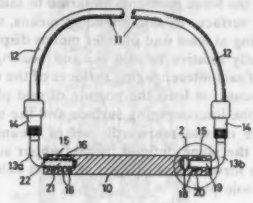
Brigitte Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH, Germany

Filed July 10, 1974, Ser. No. 487,131

Claims priority, application Germany, July 12, 1973, 2335473

Int. Cl.² A63C 9/00

U.S. Cl. 280—11.35 P 8 Claims



1. A retaining mechanism for ski bindings with a retaining means serving for retaining a ski boot, said retaining means being adapted to be inserted by means of inwardly directed pin portions into lateral cross bores provided on a relatively fixed part, the cross bores being provided with a thread for the accommodation of pin portions provided with corresponding counter threads and with bayonet-like grooves for the accommodation of pin portions provided with corresponding elements to be coupled bayonet-like with said grooves, whereby retaining means with pin portions having either bayonet-like or threaded ends may alternatively be utilized with the same cross bores.

3,936,064

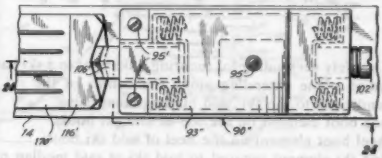
SAFETY SKI BINDING

Frank P. D'Alessio, Franklin Lakes, N.J., and Erl A. Koenig, Troy, N.Y., assignors to GPI, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 121,422, March 5, 1971, Pat. No. 3,838,866. This application Nov. 13, 1973, Ser. No. 415,466

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 K 4 Claims



1. A safety binding for releasably securing a boot having a sole formed with a lower surface to a ski, comprising a sole plate having an upper surface substantially defining a plane supporting said boot lower surface; means for releasably securing said boot to said sole plate; and first and second sets of means for releasably affixing said sole plate to said ski positioned respectively forwardly and rearwardly of a line intermediate to the ends of and normal to the long axis of said sole plate, said sets of means being shaped to permit both relative lateral and relative normal displacement of said ski and sole plate at both sets thereof, both of said sets of means including cooperative interengaging surfaces defining a pocket and a projection into said pocket, one of each of which surfaces is positioned on said ski and the other of each of which surfaces is positioned on said plate and the surfaces of each of which sets of means contact each other along an interface shaped to cause said plate to be impelled toward said ski and to laterally position said plate relative to said ski in the region of both of said sets of means as said cooperating interengaging surfaces

of each such set are concurrently impelled toward each other; and means for impelling said surfaces in each of said sets toward each other concurrently, which impelling means is sufficiently yielding to permit said cooperating interengaging surfaces of either of said sets of means to become disengaged from each other through relative displacement by motion having an axial component and either a lateral component, a normal component, or a combination of lateral and normal components due to the application of force moments counterdirectional to the force moments imparted to said cooperating interengaging surfaces by said impelling means, said impelling means including at least one plunger means displaceable substantially axially relative to said ski and bearing at one end thereof one of said interengaging surfaces of the rearwardly of said sets of means, at least the portion of said plunger means bearing said one interengaging surface and the other interengaging surface of said rearwardly set of means being positioned below the plane defined by said upper surface of said sole plate, the forwardly of said set of means being positioned beneath said sole plate.

3,936,065

SAFETY SKI BINDING

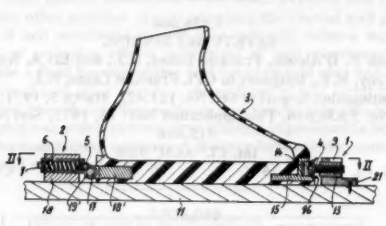
René Ramillon, 3, rue Emile Zola 38029, Grenoble & Cedex, France

Filed Oct. 29, 1974, Ser. No. 519,002

Claims priority, application France, Oct. 31, 1973, 73.39464; Apr. 30, 1974, 74.15818

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 T **10 Claims**



1. A safety ski binding for securing a ski boot to a ski having a median plane extending along the center of the ski and perpendicular to the ski, said binding comprising:

a toe boot element on the toe of said ski boot;

a heel boot element on the heel of said ski boot;

a toe ski element secured to said ski at said median plane and lockingly engageable with said toe boot element, one of said toe elements comprising a pair of generally cylindrical and parallel pins flanking said median plane and the other of said toe elements being a profiled button lying in said plane and engageable between said pins;

means coacting between said toe elements for resisting vertical release of the boot from the ski;

a heel ski element secured to said ski at said median plane, and lockingly engageable with said heel boot element, one of said heel elements being a generally cylindrical body having an axis lying substantially perpendicular to said plane and being formed at said plane with a circumferential groove and the other heel element being a profiled button lying in said plane and engaging in said groove in force-transmitting relationship in said plane along said ski; and

means for urging one of said ski elements along said plane toward the other ski element whereby a biasing force is applied through said boot elements to said other ski element.

3,936,066

SAFETY SKI BINDING

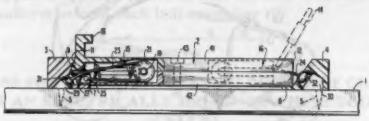
Gerhard Witting, Clemensstrasse 121, D8 Munich 40, Germany

Filed Sept. 26, 1974, Ser. No. 509,494

Claims priority, application Germany, Sept. 28, 1973, 2348905

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 N **6 Claims**



1. A safety ski binding comprising a rigid base plate arranged for detachable fastening to a ski boot, said base plate including two spaced release devices for establishing automatically releasable connections between the base plate and the ski, the automatic release being effected upon occurrence of an excessive force tending to separate said base plate and ski at the location of a release device, said release devices each including at least one guide roller mounted for movement along said base plate transversely of the roller axis, cable means fixed at one end to said base plate and passing over said guide roller and outwardly of said base plate for attachment to the ski, and spring means biasing said guide roller along its path of movement for applying tension to said cable means and permitting it to be drawn a distance from said base plate greater than said guide roller moves in response thereto.

3,936,067

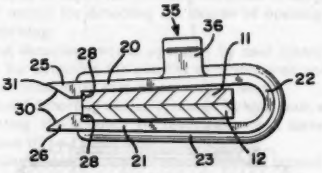
SKI CLAMP

Reinhold G. Link, Dayton, Ohio, assignor to Linkspiel, Inc., Dayton, Ohio

Filed June 11, 1975, Ser. No. 585,978

Int. Cl.² A63C 11/02

U.S. Cl. 280—11.37 A **4 Claims**



1. A clamp for use in holding a pair of skis, said clamp comprising

an integral body having outwardly extending arms joined by a generally U-shaped neck portion,

said arms and neck portion being sufficiently resilient to accommodate flexing of said arms in a parting direction whereby said arms will exert clamping force against a pair of skis fitted between said arms,

tip parts on each of said arms,

at least one of said tip parts including a shoulder facing inwardly of said clamp toward said neck portion so as to engage around an edge of a ski, at least one of said tip parts having a ramp portion extending divergently toward its end from the other tip part so as to cause said arms to spread when the clamp is pushed along the length of said arms against an edge of the skis,

and a retainer section formed as part of said body and including opposed resilient ribs forming a pole receptacle

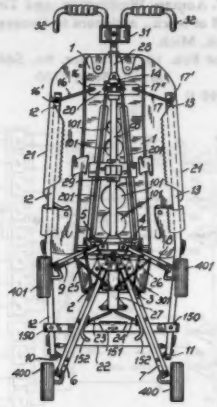
the axis of which is generally parallel to the outwardly extending direction of said arms of the clamp.

3,936,068
REFUSE CARRIER
Ira S. Dorman, 146 Page Drive, Oakland, N.J. 07436
Filed Dec. 10, 1973, Ser. No. 423,522
Int. Cl.² B62B 1/04
U.S. Cl. 280—34 B **14 Claims**

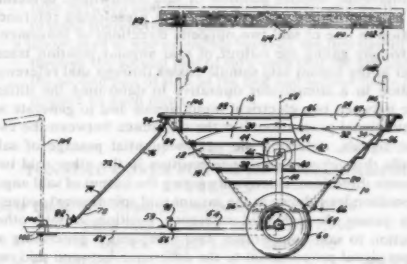
1. A refuse carrier comprised of a chassis and at least one wheel on which said chassis is mounted, said chassis having opposed sidewall portions, rearwardly-disposed handle means for manipulating said carrier, and readily and substantially nonobstructively disengageable means for temporarily maintaining lateral spacing between said sidewall portions and permitting, upon disengagement of said spacing means, movement of said sidewall portions laterally with respect to one another, said spacing means at least in part defining a front wall portion of said chassis which extends, in the normal transport position of said carrier, generally upwardly from adjacent said wheel and terminates in a relatively thin forward edge, and said sidewall and front wall portions cooperatively defining a normally upwardly opening cavity within said chassis, said chassis being pivotable in a vertical plane about the axis of said wheel from a normal transport position of said carrier to a forwardly-tipped position in which said chassis rests upon said forward edge and said wheel, and the opening of the cavity thereof is generally forwardly disposed, said chassis and said wheel being so dimensioned and disposed, relative to one another, that the center of gravity of said chassis is located rearwardly of said forward edge in the forwardly-tipped position of said carrier, to afford stable resting on said edge.

3,936,069
COLLAPSIBLE BABY STROLLER
Pietro Giordani, Via Rupe, 19, Sasso Marconi, Italy
Filed Jan. 20, 1975, Ser. No. 542,735
Claims priority, application Italy, Jan. 24, 1974, 12442/74
Int. Cl.² B62B 1/00
U.S. Cl. 280—36 B **9 Claims**

1. A collapsible baby stroller having at least one seat member, wheels for moving the stroller on the ground, at least one handle member for carrying and pushing the stroller and an articulated lever system cooperating in supporting said seat member and said wheels, the configuration of said lever system being transformable from a collapsed configuration into an unfolded configuration and vice versa, characterized in that the stroller further comprises a control rod for said lever system, a rigid supporting body structure slidingly suporting said control rod shiftable with respect to said supporting body structure from at least one position thereof into at least another position thereof, said articulated lever system which cooperates in supporting said seat member and said wheels having a first group of articulated component members linked to said rigid supporting body structure and a second group of articulated component members linked to said control rod, said control rod causing said articulated lever system and said seat member and wheels carried by it to assume a collapsed configuration when the control rod is shifted into said one position thereof and causing said articulated lever system and said seat member and wheels carried by it to assume an unfolded configuration when the control rod is shifted into said other position thereof.



3,936,070
CARTS
Kenneth B. Owings, 620 Pugh Road, Strafford, Pa. 19087
Continuation of Ser. No. 154,504, June 18, 1971, abandoned.
This application Feb. 1, 1974, Ser. No. 438,907
Int. Cl.² B62B 1/12
U.S. Cl. 280—47.18 **12 Claims**

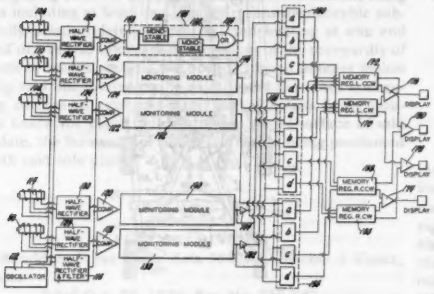


5. A cart comprising an elongated, concave body portion forming a carrying compartment normally disposed in a first position with its concavity facing upwardly, a pair of wheels, and means associating said body portion and wheels, and including framing having means defining a first axis about which said wheels may rotate, and means defining a second axis parallel to and disposed generally vertically above said first axis, said latter means being coupled to said body portion in a region intermediate both its length and its height and providing for pivotation of said body portion, about said second axis, between a pair of opposed positions in each of which said concavity faces longitudinally, said body having two sloping end walls similar in length and in slope with relation to an upright plane containing said two axes when the concavity faces directly upwardly, and the angle between said two walls being such that in one of said opposed positions one such wall will be in a position close to the horizontal and in the other of said opposed positions, the extreme edge of the other such wall will be in close proximity to a surface on which said wheels ride.

3,936,071
STEERING SYSTEM MONITORING APPARATUS AND PROCEDURE

James B. Ricketts, Jr., Warren; William A. Hehs, Birmingham; John T. Auman, Washington, and Timothy R. Schlax, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1975, Ser. No. 548,196
Int. Cl. B62d 7/20
U.S. Cl. 280—95 R 5 Claims



1. A procedure for monitoring lash in the steering system of a vehicle, said steering system including a wheel spindle supported on the vehicle for pivotal movement in two opposite directions about a steering axis of said vehicle, a steering handwheel rotatably supported on said vehicle for manual manipulation, and gear and linkage means disposed between said spindle and said handwheel for effecting pivotal movement of said spindle in response to rotation of said handwheel, comprising the steps of continuously monitoring the angular position of said handwheel with an angular position transducer operative to generate an electrical signal corresponding to the instantaneous angular position of said handwheel, detecting the passage of said spindle through a preselected reference position in one of said two opposite directions of movement, electrically gating the output of said angular position transducer at the instant said spindle passes through said reference position to a comparator operative to determine the difference between two electrical input signals and to generate an output signal proportional to the difference between the two input signals, detecting the next sequential passage of said spindle through said reference position in the other said two opposite directions, electrically gating the output of said angular position transducer at the instant said spindle next sequentially passes through said reference position in said other direction to said comparator, said comparator generating an output signal proportional to the difference between said two sequentially gated signals from said angular position transducer, and conducting said comparator output signal to a display means for warning of improper lash condition when said comparator output signal achieves a preselected magnitude.

3,936,072
AXLE LIFT MECHANISM

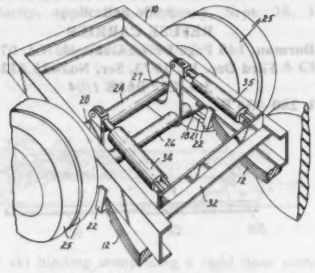
Darwin Mandel, R.R. 1, Huron, S. Dak. 57550

Filed Oct. 23, 1974, Ser. No. 517,188
Int. Cl.² B60G 5/06
U.S. Cl. 280—104.5 R 2 Claims

1. A truck axle lift structure for a trailing axle of a tandem axle structure which trailing axle is supported pivotally on fixed brackets beneath the truck frame supporting a cross shaft, said structure comprising

support means for mounting on a truck frame to afford a pivot axis, said support means including a hollow shaft adapted to receive said cross shaft,

a pair of bell-cranks carried by said support means in transversely spaced relationship, each said bell-crank comprising a cam surface spaced from said support means on one arm of said bell-cranks and adapted to slidably engage the undersurface of an axle,



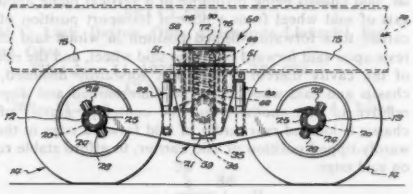
bracket means for attachment to a truck frame, and

a pair of power cylinders each connected to a different one of said bell-cranks and to said bracket means for moving said bell-cranks and support means to afford lifting movement of the axle.

3,936,073
TANDEM AXLE VEHICLE SPRING SUSPENSION

Albert F. Hickman, Eden, N.Y., and Robert G. Moore, Elkhart, Ind., assignors to Hickman Developments, Inc., Eden, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,422
Int. Cl.² B60G 11/52
U.S. Cl. 280—104.5 A 10 Claims



1. A tandem axle spring suspension adapted to be interposed between a vehicle frame and a pair of tandem axles having rubber tired wheels journalled at the ends thereof, having a walking beam arranged at each of said frame and extending lengthwise thereof close to the inner vertical faces of the corresponding pair of tires, a horizontal cross rod extending transversely of said frame toward the space between said tires at each side of said vehicle and with its ends arranged adjacent the central parts of said walking beams, a pair of bearings journalling said cross rod near the ends thereof on said central parts of said walking beams, and means movably connecting each end of each walking beam with a corresponding axle end wherein the improvement comprises means resiliently supporting opposite sides of said frame on the ends of said cross rod, comprising a pedestal mounted on each cross rod end adjacent the outboard part of the corresponding one of said bearings, a metal helical compression spring mounted on each pedestal, means supported on top of each metal helical compression spring and supporting the corresponding side of said frame, and means providing high and widely spaced spring pivot points for said frame on the opposite ends of said cross rod and also providing a large proportion of the resilient support for said frame on said cross rod in addition to said metal helical compression springs, comprising at least one upright first plate secured to each cross rod end outboard from the corresponding metal helical compression spring, a resilient rubber body fixed to one face of said upright plate, a

second upright plate fixed to the opposite side of said flexible rubber body in generally parallel relation to said first plate, and means securing said second plate to said frame.

3,936,074

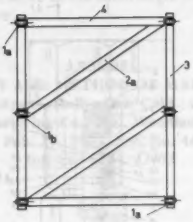
VEHICLE CHASSIS

Ernesto Prinoth, Corso 33, Ortisei (BZ), Italy

Continuation-in-part of Ser. No. 322,604, Dec. 16, 1971, abandoned. This application Apr. 9, 1974, Ser. No. 459,239

Int. Cl.[2] B62D 21/00

U.S. Cl. 280—106 R 6 Claims



1. A vehicle chassis for a vehicle comprising:

a frame composed of four rigid frame members, said frame members being one pair of side members and one pair of end members in a rectangular arrangement, and elastic torsional coupling means connecting the adjoining ends of at least two of said frame members for limited swinging movements between them in all directions.

3,936,075

MATERNITY PROTECTION DEVICE

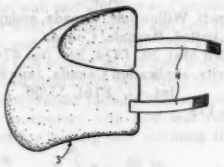
Robin Stewart Jelliffe, 38 Gordon St., Coffs Harbour, N. S. W. 2450, Australia

Filed Mar. 4, 1974, Ser. No. 447,622

Claims priority, application Australia, Mar. 13, 1973, PB 2565/73

Int. Cl.[2] B60R 21/02

U.S. Cl. 280—150 B 1 Claim



1. A device for protecting the protuberant abdomen of a pregnant woman, the device comprising a substantially rigid dome, and lugs located on and secured to an outside surface of the dome, said dome being shaped to correspond substantially with the shape of the protuberant abdomen of the pregnant woman in a sitting posture in a vehicle and being sized to fit over and cover the protuberant abdomen, said dome being capable of being fitted between a conventional vehicle safety belt and the protuberant abdomen such that in use the safety belt lies across the dome and thereby holds the device in position, and the lugs being adapted to permit the vehicle safety belt to be held therein, thereby preventing the safety belt from slipping off the dome.

3,936,076

CYCLE SHOCK ABSORBER

Kendall D. Probst, 935 20th St., Ogden, Utah 84401

Filed Aug. 23, 1974, Ser. No. 500,050

Int. Cl.[2] B62K 21/18

U.S. Cl. 280—276 5 Claims

1. A shock absorber comprising

a first elongated tube having a first pair of slots on opposite sides of the tube near one end thereof,

a second elongated tube, one end of which slidably fits in said one end of the first tube, said second tube having a second pair of slots on opposite sides and extending lengthwise of the second tube and generally aligned with the first pair of slots, the second pair of slots being longer than the first pair,

a first plug secured in said first tube between the first pair of slots and the other end of the tube,

a second plug secured in said second tube at said one end,

at least one resilient wire mesh pad disposed in said first tube between said first and second plugs and partly compressed therebetween, and

a tab secured in and extending between the first pair of slots through the second pair of slots such that the tab slides in the second pair of slots as the first and second tubes move relative to each other.

3,936,077

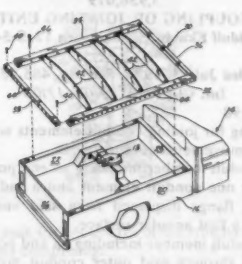
TONNEAU COVER FOR FIFTH WHEEL CAMPER TRUCKS

Arie Blick, 903 Grand, Emmetsburg, Iowa 50536

Filed Mar. 4, 1974, Ser. No. 447,790

Int. Cl.[2] B62D 53/00; B60J 7/10

U.S. Cl. 280—423 R 10 Claims



1. In combination with a truck having a box defined by upstanding walls and a fifth wheel means positioned in said box, comprising,

a flexible tonneau cover,

and fastening means operatively securing the periphery of said cover to said walls so that said cover extends thereover,

said cover having an opening formed therein above said fifth wheel means so that the king pin of a trailer means may extend downwardly through said cover and downwardly into said box to said fifth wheel means,

said opening being positioned at the longitudinal center line of said box when said cover is mounted on said walls.

3,936,078

DAMPING DEVICE FOR COUPLING TOGETHER PIPING ELEMENTS

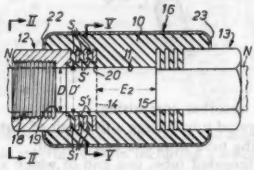
René Wallyn, 77 Claye-Souilly, France

Filed May 17, 1974, Ser. No. 470,830

Claims priority, application France, Apr. 17, 1974, 74.13388

Int. Cl.² F16L 11/12

U.S. Cl. 285—49 **3 Claims**



1. A damping device for coupling together two lengths of pipe to permit the conveyance of fluid under pressure from one length to the other, comprising two tubular end members, polygonal in transverse section, spaced apart from each other, said end members including a plurality of transverse grooves extending through from the peripheries to the bores of said members, said members each having in addition, a continuous peripheral groove spaced closer to the extremities of said device than said first mentioned grooves, said peripheral groove extending partially into the body of said members, an elastic sleeve over-molded on said end members and including components extending into said grooves, a tubular covering jacket surrounding said sleeve, said jacket being provided at its extremities with transverse inturned edges directed substantially radially in the direction of the axis of said members, said edges partially covering the corresponding extremities of said sleeve, said edges being disposed in alignment with said continuous grooves in said members, and fixation means rigidly connected to said jacket for mounting said device to a support.

3,936,079

COUPLING OR JOINTING UNIT

Bror Thure Fridolf Ekman, Slalomvagen 12, S-541 00 Skovde, Sweden

Filed July 5, 1974, Ser. No. 485,950

Int. Cl.² F16L 17/02, 17/06

U.S. Cl. 285—98 **7 Claims**

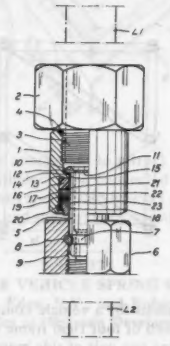
1. A coupling for joining conduit elements subject to relative swiveling movements comprising:

an outer conduit member including an end portion adapted to engage one conduit element and a radially inwardly extending flange displaced from said end portion for providing a first annular surface,

an inner conduit member including an end portion adapted to extend through said outer conduit member and an opposite end portion with a radially outwardly extending flange providing a second annular surface facing said first annular surface and capable of limiting the movement of said inner conduit member relative to said outer conduit member,

a first sealing ring of low friction material between said annular surfaces for sealing said conduit members against fluid leakage when said surfaces are urged toward each other by a predetermined pressure acting on the radially outwardly extending flange of the inner conduit member and resulting from the fluid pressure and external forces on the conduit members,

an annular sealing compartment being defined between the inner surface of said outer conduit member and the outer surface of said inner conduit member in the leakage path between said conduit members downstream of said first sealing ring, and



sealing means in said compartment including a second sealing ring backed up by axially resilient spring means, said second sealing ring normally sealing said passage against leakage at fluid pressures less than said predetermined pressure and said spring means acting to absorb energy upon imposition to the second sealing ring of fluid pressure exceeding said predetermined pressure to allow the second sealing ring to seal said passage without causing binding of said conduit members together when the facing surfaces of said members are displaced from sealing position due to external forces exerted on the conduit members.

3,936,080

PIPELINE EXPANSION JOINT HAVING A SMOOTH BORE

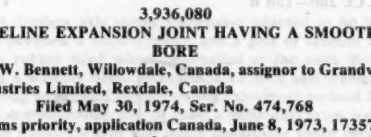
David W. Bennett, Willowdale, Canada, assignor to Grandview Industries Limited, Rexdale, Canada

Filed May 30, 1974, Ser. No. 474,768

Claims priority, application Canada, June 8, 1973, 173572

Int. Cl.² F16L 55/00

U.S. Cl. 285—175 **7 Claims**



1. A pipeline expansion joint having a smooth bore for use with pipelines into which flow slurries containing solids in suspension comprising:

a. a first sleeve open at both ends and having a tapered portion formed in the inner wall of one of its ends extending at a small angle with the axis of the first sleeve and over a substantial portion of its length from its inside diameter to substantially its outside diameter; and

b. a second sleeve also open at both ends and having a first portion of substantially the same inner diameter as the outer diameter of said first sleeve and telescopically mounted on said one end of the first sleeve, a second portion of substantially the same inside diameter as that of said first sleeve, and an intermediate portion expanded at a small angle with the axis of the second sleeve over a substantial portion of its length from said second portion to said first portion of the second sleeve, thereby providing a smooth bore throughout the expansion joint with no area of abrupt changes in order to prevent turbulence and the resulting wear of the expansion joint by the solids in suspension in the slurries; and

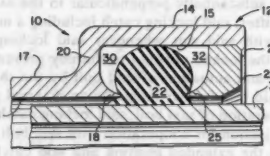
wherein the small angle of taper in said first sleeve is substantially the same as the small angle of expansion in said second sleeve.

3,936,081

PIPE JOINT AND METHOD OF MAKING SAME

James J. Blumenkranz, Hollywood, Calif., assignor to R & G Sloane Manufacturing Co., Inc., Woodland Hills, Calif.

Filed Feb. 27, 1974, Ser. No. 446,518
Int. Cl.² F16L 21/02
U.S. Cl. 285—231 8 Claims



1. A pipe joint including an annular wall having an inwardly extending shoulder spaced axially from an open end thereof; said annular wall and said shoulder defining a socket, a first lip extending from said shoulder toward said open end and spaced radially from said annular wall; an annular retaining ring wholly within said socket adjacent to said open end and spaced axially from said first lip, a second lip spaced from said first lip extending from said retaining ring toward said first lip; an annular seal ring between and in contact with said first and second lips, the seal ring cross-sectional dimension at the mean diameter of said seal ring being larger than the spacing between said first and second lips and residing radially between said annular wall and said first and second lips; said seal ring, said annular wall, said shoulder and said first lip defining a first clearance and said seal ring, said annular wall, said retaining ring and said second lip defining a second clearance, said first and second clearances permitting said seal ring to be deformed when compressed radially by insertion of a pipe into said socket and in contact with said seal ring, and means within said socket for locking said retaining ring within said annular wall.

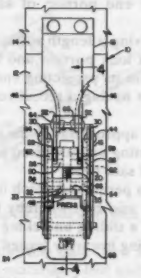
3,936,082

CATCH WITH ANTI-RELEASE LATCH

Gunnar E. Swanson, Middletown, Conn., assignor to The Nielsen Hardware Corporation, Hartford, Conn.

Filed Oct. 11, 1974, Ser. No. 514,200
Int. Cl.² E05C 5/00
U.S. Cl. 292—113 38 Claims

1. In a catch for releasably securing one part to another part carrying a strike, the catch having a base member adapted to be attached in fixed position to the one part, an operating lever, means connecting said operating lever to said base member for pivotal movement relative thereto between open and closed position, a drawbar, means connecting said drawbar to said operating lever for movement therewith into and out of connected engagement with the strike, said operating lever being operable upon movement to its closed position to move said drawbar into and retain it in connected engagement with the strike, a control assembly including a control member and a latch element, and means supporting said control assembly on said operating lever for movement relative thereto and to said base member between latching and releasing positions and for movement with said operating lever between its open and closed positions, said control member being supported for movement with said operating lever and relative thereto, said latch element being supported for movement with said control member and relative thereto and cooperating with said base member in said latching position to releasably retain said



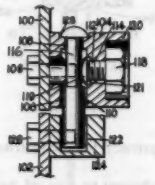
operating lever in its closed position, the improvement comprising first means for moving said latch element relative to said control member, relative to said operating lever and relative to said base member during one portion of the travel of said control assembly from its latching toward its releasing position, and second means for moving said latch element and control member in unison and relative to said operating lever and said base member during another portion of the travel of said control assembly from its latching toward its releasing position to move said latching means out of latching engagement with said base member in response to movement of said control assembly from its latching toward its releasing position.

3,936,083

SAFETY LOCK FOR ENCLOSURES

William L. Bright, 0605 SW. Curry St., Portland, Oreg. 97201

Division of Ser. No. 230,223, Feb. 29, 1972, Pat. No. 3,791,683. This application Dec. 3, 1973, Ser. No. 421,445
Int. Cl.² E05C 1/04
U.S. Cl. 292—149 1 Claim



1. A safety lock for enclosures of the type having a wall with a door therein, comprising:

a. a first lock portion arranged to be secured to one of said door and wall means,

b. said first lock portion having a bore therethrough,

c. a bolt threadedly mounted in said first lock portion for axial adjustment and having an end portion capable of

being moved laterally into said bore upon selected adjustment of said bolt,

d. said bolt having a head of non-conventional shape whereby to be capable of rotation only by a special tool and thus non-removable by unauthorized persons,

e. said first lock portion including a protective wall portion peripherally surrounding said bolt head and open at its outer end,

f. said wall portion defining a socket which is at least as deep as the thickness of the bolt head to prevent side engagement of the bolt head by unauthorized persons and which is of greater diameter than said bolt head to permit removal of the bolt by a special tool inserted through the open end of the protective wall portion,

g. a lock pin slidably disposed in said bore and being engageable by the end portion of said bolt in a locking function,

h. said lock pin having a length sufficient to project at one end beyond said lock portion and having a head at the end opposite from its projecting end,

i. said lock portion having a recess receiving said lock pin head,

j. said recess being approximately the same diameter as said head and preventing unauthorized prying engagement on the underside of said head,

k. means defining a peripheral notch in said lock pin having association with said bolt whereby the latter upon being retracted allows a sliding unlocking function of said lock pin and upon being inwardly turned locks said lock pin in a set position,

l. said bore in the area of the notch having a narrowed portion of lesser diameter than the unnotched portion to confine the lock pin slidably therein,

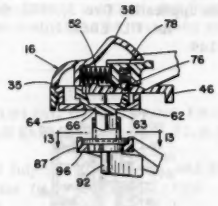
m. and a second lock portion arranged to be secured to the other of said door and wall means,

n. said second lock portion including socket means aligned with the bore in said first lock portion and closed at its bottom end for receiving the projecting end of said lock pin and providing protection for said projecting end.

3,936,084
PRIVACY LOCK

John L. Orr, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed July 5, 1974, Ser. No. 485,992
Int. Cl.² E05C 1/10, 1/16
U.S. Cl. 292—169.15 8 Claims



1. An improved privacy lock construction comprising, in combination;

a housing for attachment to a panel, said housing including a bolt opening at one side;

a bolt projecting from said housing through said opening for cooperation with a strike, said bolt including a manual engagement portion external the housing on another side of said housing, said bolt also including bifurcated, separated arms extending within the housing opposite the direction of projected bolt travel, toward the strike, each of said arms including engagement means;

biasing means in said housing engaging said bolt and biasing said bolt toward the projected position;

rotatable shifter means rotatable substantially about an axis normal to the direction of bolt travel, said shifter means extending from within said housing intermediate said bolt arms, said shifter means including a post extending along the axis of rotation for connection with shifter drive means on the opposite side of said panel from said housing, said shifter means including radial projecting means for engaging said engagement means of said bolt and for driving said bolt against the biasing means upon rotation of said shifter means in either direction; and

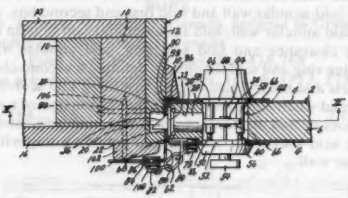
a fixed, outside handle for attachment to the panel on the opposite side from said housing, said handle including an opening therethrough including an overlying flange for retaining shifter drive means against the panel.

8. An improved privacy lock comprising, in combination: a housing having a biased bolt projecting therefrom for engagement with a strike, a shifter mounted in said housing for rotation about an axis substantially normal to the direction of bolt movement, said shifter cooperatively engaging said bolt upon rotation of said shifter to cause movement of said bolt against the biasing force thereon, said shifter cooperable with manually operated drive means, and a locking catch having a locked and an unlocked position and cooperable with said shifter to prevent rotation thereof whenever said locking catch is in the locked position, said shifter including a slot, said slot extending in a plane substantially perpendicular to the axis of rotation of said shifter, said locking catch including a member for engagement with said slot whenever said locking catch is positioned in the locked position to thereby prevent rotation of said shifter and actuation of said bolt by the shifter drive means; and said bolt further including an external projection for manual operation of said bolt, said locking catch including a forward projection for cooperation with said bolt whenever said bolt is in the extended position and said catch is in the locked position, whereby manual operation of said bolt against the biasing force thereon disengages said locking catch from said shifter.

3,936,085
DOOR LOCK PROTECTOR

Donald L. Long, 6621 W. 94th Terrace, Overland Park, Kans. 66212

Filed Feb. 24, 1975, Ser. No. 552,695
Int. Cl.² E05C 17/36
U.S. Cl. 292—264 3 Claims



1. In combination with a wooden door having opposite vertical faces and opposite vertical edge surfaces, a door frame to which one vertical edge of said door is hinged, and a lock mechanism including a bolt carried in said door and extendable from the free edge of said door, and a striker plate carried by said door frame and engageable by said bolt, a lock protector comprising:

a. a chain plate of right-angled form, a first leg of which overlies the face of said door frame confronting the free edge surface of said door, and the second leg of which overlies the face of said door frame toward which said door opens,

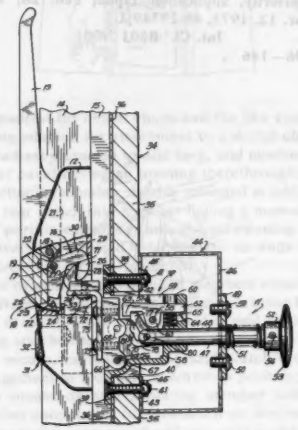
b. means affixing both legs of said chain plate rigidly to said door frame,
c. a safety chain, and
d. means attaching the respective ends of said safety chain to said door adjacent the free vertical edge thereof, and to said chain plate, one of said attaching means being readily detachable, said means attaching one end of said chain to said door comprising a strong, U-shaped metal door plate adapted to enclose the free edge portion of said door with its parallel legs overlying the faces of said door and the connecting portion thereof bridging the free edge surface of said door, one end of said chain being attached to said door plate, and means rigidly affixing said door plate to said door.

3,936,086

INSIDE SAFETY RELEASE LATCH DEVICE

Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Hardware Corporation, Binghamton, N.Y.

Continuation-in-part of Ser. No. 477,259, June 7, 1974. This application July 22, 1974, Ser. No. 490,310
Int. Cl.² E05B *15/02*
U.S. Cl. 292—341.17 **16 Claims**



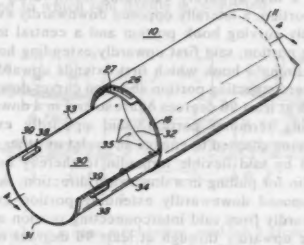
1. A safety striker mechanism for use with enclosure door latches or the like of the type having a movable keeper latch member adapted to releasably engage and be captively held by a stationary striker member when in a locked condition, said safety striker mechanism comprising, in combination, a striker member having surfaces disposed in the path of and capable of holding a latch member associated with a door latch in a locked condition, and safety release means actuated independently of said door latch and accessible from within an enclosure locked by said door latch for urging said striker member out of the path of said latch member thereby unlocking said door and permitting ingress to and egress from said enclosure without substantially moving said latch member, said safety release means comprising a bar member supporting said striker member and itself supported for pivotal movement about a first axis, a link member supported by said bar member for pivotal movement about a second axis, a lever member cooperative with said link member and supported for pivotal movement about a third axis, and actuating means cooperative with said link member for first causing pivotal movement thereof about said second axis and only thereafter causing pivotal movement of the combination of said link member, said bar member and said striker member about said first axis, said lever member preventing said pivotal movement of said striker member during normal times when said actuating means is in a locked position, said lever member engaging and preventing pivotal movement of said link member about said first axis during said normal times.

3,936,087

COLLECTION RECEPTACLE

William R. Alexander, 223 Rambling Way, Springfield, Pa. 19064

Filed Oct. 15, 1974, Ser. No. 514,588
Int. Cl.² A47F *13/06*; A47L *13/52*
U.S. Cl. 294—1 R **6 Claims**



1. A collection receptacle for use with a plastic bag which comprises
a semi-rigid self-supporting base open at its ends formed of a sheet of flexible material rolled and detachably secured together along its length to form a cylinder,
a scraper tray carried by said base and extending from one end thereof,
hand hold means on said receptacle, and
bag holding means comprising overlapped portions of said hand hold means and said scraper tray with said base for reception of an end portion of said bag in assembled relation of said bag with respect to said base.

3,936,088

FLEXIBLE TARPAULIN HANDLING DEVICE

Charles Samuel Williams, 4013 - 49th St., Lubbock, Tex. 79413

Filed July 1, 1974, Ser. No. 484,893
Int. Cl.² A47F *13/06*
U.S. Cl. 294—19 R **4 Claims**

1. A flexible tarpaulin handling device for maneuvering tarpaulins equipped with grommets or eyelets, said device comprising the combination of:

a. An elongated handle member, said handle having a grasping portion at one end thereof, said portion having a polygonal cross section to assist in positively gripping the device, said handle member also defining a shank portion on the opposite end of said handle, said shank portion being adapted to receive a bifurcated tang portion of a tarp hook,

b. A tarp hook having a bifurcated tang portion adapted to cooperate with said handle portion in securing said hook to said handle and

c. A double ended integrally formed tarp hook member mounted on said bifurcated tang portion, said member having a first upwardly extending downwardly curving hook portion, a laterally opposed downwardly extending upwardly curving hook portion and a central interconnecting portion, said first upwardly extending hook portion defining a hook which first extends upwardly from said interconnecting portion and then curves downwardly through at least 90 degrees of arc to end in a downwardly extending terminal portion, said upwardly extending hook being adapted to engage an eyelet or other opening defined by said flexible tarpaulin to thereby hook said tarpaulin for pulling in a downward direction; said laterally opposed downwardly extending portion extending downwardly from said interconnecting portion and then curving upwardly through at least 90 degrees of arc to end in an upwardly extending terminal portion, each of said hook portions defining substantially the same radius of curvature, said interconnecting portion being fixably attached to said bifurcated tang portion.

3,936,089

GRIPPING DEVICE FOR A LIFTING MECHANISM, ESPECIALLY IN A CORE REACTOR FOR DEPOSITING AND PICKING UP FUEL ELEMENTS AND CONTROL RODS

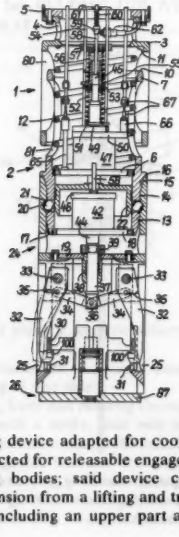
Bernhard Hoffmeister, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 2, 1974, Ser. No. 485,265

Claims priority, application Germany, Sept. 1, 1973, 2344264

Int. Cl. B66c *1/66*; G21c *19/10*

U.S. Cl. 294—86 A **5 Claims**



1. In a gripping device adapted for cooperation with gripping tools constructed for releasable engagement with longitudinally extending bodies; said device comprising a body adapted for suspension from a lifting and transporting mechanism, said body including an upper part and a lower part in telescopic reciprocable engagement, upper and lower power operable devices in said lower part, gripping means carried by said lower part for coupling the lower part to a gripping tool and connected to said upper power operable device, said lower power operable device adapted for actuating the gripping tool connected to said lower part for coupling the gripping tool to a body to be lifted thereby, respective spring means biasing said power operable devices in coupling direction, a sleeve connected to each power operable device and extending upwardly therefrom, said sleeves being in slidable telescopic engagement, said springs surrounding said sleeves and at one end bearing on a support stationary with said second part and at the other end bearing on a plate connected to the respective sleeve.

3,936,090

VEHICLE DOOR

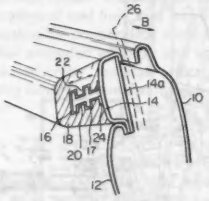
Norimoto Aya, Yokosuka; Kuniholro Takahashi, Fujisawa; Kenji Osaka, Chigasaki, and Naohito Kusunose, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 27, 1974, Ser. No. 446,267

Claims priority, application Japan, Feb. 28, 1973, 48-23289; Mar. 12, 1973, 48-29749[U]

Int. Cl.[2] B60J *5/00*

U.S. Cl. 296—146 **1 Claim**



1. Reinforcing and shock absorbing members in combination for a vehicle door having a door inner panel, comprising:

an outer member including an elongated first member having generally a C-shaped cross section, and an elongated second member of a flat sheet, said first and second member being made of metals and being united at the edges thereof to constitute a box construction, said outer member being securely connected to said inner panel in such a manner that said first member forms a desired profile of the upper edge portion of said door inner panel;

an elongated inner member made of a metal and having generally a U-shaped cross section with a pair of leg portions terminating at an open end thereof, said pair of leg portions being firmly mounted, at the open end of said inner member, on the back portion of the first member so that the elongated inner member is arranged in parallel with said outer member and the open end of said inner member is closed by said elongated first member of said outer member, and each of said leg portions having a pair of outwardly extending channel portions which are arranged in parallel with said outer member; and

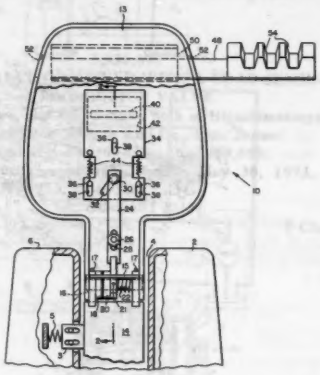
an elastomeric member wrapping said elongated inner member and being firmly mounted on the said elongated first member.

3,936,091

HEADREST FOR DENTAL CHAIR

Azriel Jay Rabinowitz, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,733
Int. Cl.[2] A47C 7/62
U.S. Cl. 297—188 11 Claims



1. A headrest for dental chairs and the like comprising:
a. a tang adapted for attachment to a dental chair;
b. a headrest journaled to said tang, said headrest including a rear panel having an opening therethrough;
c. an actuating member slidably mounted in said headrest to said rear panel, said member having a manually engageable portion extending through said opening;
d. a lever arm pivoted intermediate its ends within said headrest to said rear panel;
e. a pair of axially aligned clutch members within said headrest frame, one of said clutch members being fixed to said tang at said journal and a second of said clutch members being attached to said lever arm;
f. bias means, normally urging said clutch members into engagement to lock said headrest in position; and
g. cam means on said actuating member and lever arm member cooperating to pivot said lever arm responsive to the manual movement of said actuating member for moving said second clutch member against said bias and out of engagement with said first member to unlock said headrest.

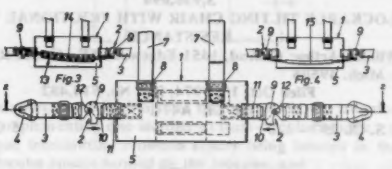
3,936,092

SAFETY HARNESS

Gunter Dietz, Donberg, Germany, assignor to Gebr. Happich, GmbH, Germany

Continuation-in-part of Ser. No. 416,079, Nov. 15, 1973, abandoned. This application Sept. 26, 1974, Ser. No. 509,323
Claims priority, application Germany, Nov. 18, 1972, 2256650
Int. Cl.[2] A62B 35/00
U.S. Cl. 297—385 15 Claims

1. A safety harness arrangement for restraining a person, comprising:
a waistband to be secured to the person to be restrained; said waistband having a forward portion in front of the person and having sides at the sides of said forward portion;
at least one belt connected to one said waistband sides for joining said waistband to a support, said belt has a top edge and a bottom edge when said belt is attached to said waistband;
coupling means in said belt, said coupling means being separable to separate said waistband from said belt; said coupling means comprising a first coupling element connected to said waistband and a second coupling element connected to the separable part of said belt; one of said first and second coupling elements comprising a latching means and the other of said first and second coupling elements comprising a latch element that is to be latched onto by said latching means and that is to be released from latching by said latching means;
said latching means including a mechanism for engaging said latch element; a handle connected to said latching means mechanism; said handle being swivelingly connected to a swivel on the one of said belt and said waistband to which said handle is connected;



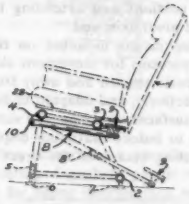
said latching means mechanism, said latch element and said handle being so shaped and located that upon swiveling of said handle in the direction toward said waistband, said latching means is uncoupled from said latch element, said handle and its said swivel being oriented and adapted to enable said handle to swivel in a plane generally parallel to the plane joining said belt top and bottom edges at the position of said swivel along said belt; said handle projecting beyond one of said edges of said belt, such that contact with said handle beyond that said one edge of said belt by motion in the direction toward said waistband swivels said handle to open said latching means.

3,936,093

STOWABLE, PULL-DOWN FOOTREST FOR A VEHICLE SEAT

Gerard T. Hogan, Southington, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 26, 1974, Ser. No. 527,480
Int. Cl.[2] A47C 7/50
U.S. Cl. 297—425 3 Claims



1. A stowable, pull-down footrest assembly that is adapted to be connected to and stowed under the seat framing of a vehicle seating unit, which comprises in combination:
a. a pair of telescoping-tube footrest support members that are spaced apart laterally each of said members having their forward end portions pivotally connected to the upper front part of the framing below the seating level of said seating unit,
b. a footrest plate member connecting across the rear portions of said telescoping tube support members, such that after said footrest plate member is lowered from a stowed position along with the tube support member there can be the extension of said telescoping tube members along and above the vehicle floor to reach a desired pulled-out,

footrest location for the accommodation of a passenger seated in a next rearward seating unit,

c. a movable latching member attached to the seat framing and a latch engagement member provided as a part of the rearward end portion of the footrest assembly that are in a connective association with one another such that said footrest assembly may be retained in a stowed location and alternatively released for use responsive to the movement of said latching member, and

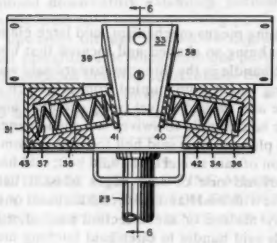
d. means remote from said latching member to move said latching member, said means being connected to the rear of said vehicle seating unit.

3,936,094

LOCKABLE TILTING CHAIR WITH FRICTIONAL TILT RESISTANCE

William Arthur Conrad, 1451 Edgewood SE., Grand Rapids, Mich. 49506

Filed Oct. 15, 1974, Ser. No. 514,482
Int. Cl.² A47C *1/027*
U.S. Cl. 297—328 **5 Claims**



1. A tiltable support for a chair seat, said support including a base structure, fulcrum means secured to said base structure and adapted to be secured to said seat to establish a pivot axis, and brake means having one portion fixed with respect to said base structure, and another portion normally secured to said seat, said brake means being operable to establish resistance to tilting movement of said seat with respect to said base structure, wherein the improvement comprises:

a member having opposite surfaces, included in one of said brake means portions and extending transversely with respect to said pivot axis; and

friction-generating means mounted on the other of said brake means portions for movement along paths generally perpendicular toward and away from said opposite surfaces, respectively, and adapted to bear resiliently on said opposite surfaces, said opposite surfaces converging in a direction to induce maximum displacement of said friction-generating means in the erect position of said seat.

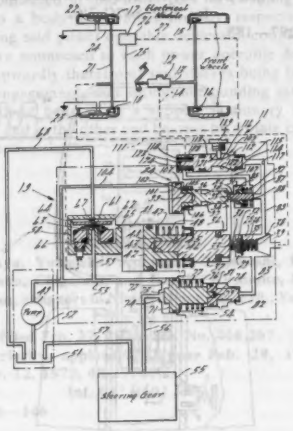
3,936,095

FAIL SAFE INDICATOR FOR SKID CONTROL SYSTEM

Peter Every, Livonia, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Aug. 24, 1973, Ser. No. 391,488
Int. Cl.² B60T *8/06*
U.S. Cl. 303—21 AF **7 Claims**

1. A vehicular skid control system comprising an operator controlled source of actuating fluid, a brake actuating circuit for delivering fluid pressure from said source to at least one wheel brake for selectively actuating said wheel brake, modulator means having a fluid input in communication with the operator controlled source of actuating fluid and a fluid output in communication with the one wheel brake, said modulator means being interposed in said actuating circuit for altering the fluid pressure transmitted from said source to said one wheel brake in response to a predetermined signal for preventing a skid condition, means responsive to the instantaneous pressure differential in said actuating circuit between said fluid input and said fluid output of said modulator means for



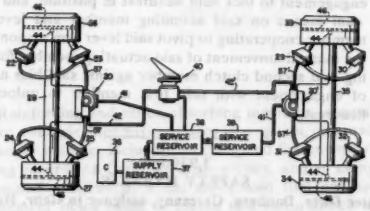
providing a signal when the pressure differential exceeds a predetermined value, and bypass valve means for providing a path of actuating fluid from said source to the one wheel brake in response to the failure of said modulator means.

3,936,096

AXLE ASSEMBLY

James C. Cumming, Oakland County, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 214,784, Jan. 3, 1972, abandoned.
This application Feb. 15, 1975, Ser. No. 550,096
Int. Cl.² B60T *8/08, 11/26*
U.S. Cl. 303—21 EB **2 Claims**



1. An anti-wheel lock vehicle axle assembly comprising an axle; a wheel hub rotatably mounted on each end of said axle and adapted to have a ground engaging wheel mounted thereon; a fluid powered brake mechanism mounted to said axle at each end thereof; each said brake mechanism being adjacent one of said wheel hubs and operative when actuated to restrain rotation of said wheel hub and any wheel mounted thereon; a sensor mounted on said axle adjacent each said wheel hub and adapted to generate electrical signals indicative of the angular velocity of said wheel hub and any wheel mounted thereon, a brake control valve assembly mounted on said axle and including a valve for selectively modulating the flow of brake actuating fluid from a source to each of said fluid powered only, a mechanisms only,a solenoid in said valve assembly for controlling the operation of said valve, and a computer in said valve assembly electrically connected to said sensors for processing the electrical signals from said sensors

and connected to said solenoid, said computer having means for delivering an output signal to successively energize and deenergize said solenoid during each of a series of discrete time intervals to respectively disconnect and connect each of said brake mechanisms to said source of brake actuating fluid upon detection of an actual or incipient skid condition, and said computer also having means for varying the ratio of solenoid ON time to solenoid OFF time during each of said time intervals.

3,936,097

RELAY VALVE COMBINED WITH A LOAD-SENSING PROPORTION VALVE

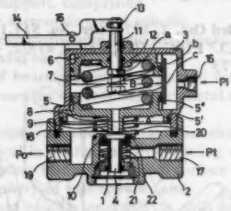
Itiro Yanagawa, and Isao Suzuki, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Japan

Filed May 10, 1974, Ser. No. 469,008

Claims priority, application Japan, May 30, 1973, 48-60555; May 30, 1973, 48-60556

Int. Cl.² B60T *8/18*

U.S. Cl. 303—22 R **7 Claims**



1. A pressure control-type relay valve comprising:

a valve body having an inlet port and outlet port for compressed fluid and an internal chamber, said body including a closeable passageway extending from said inlet port and through said chamber to said outlet port;

a valve disk being interposed in said passageway and cooperating with a valve seat formed on said body for opening and closing said passageway, said valve disk having an exhaust hole in its axial direction and being normally biased to close said passageway;

a valve bonnet connected to said valve body said bonnet including a control inlet port; and

a control piston unit provided within said bonnet and responsive to pressure applied through said control inlet port, said control piston unit including a first pressure-sensing piston for governing the valve-open actuation of said valve disk, a second pressure-sensing piston coaxially connected and resiliently coupled with said first pressure-sensing piston and stroke adjusting means for controlling the axial movement of said second pressure-sensing piston corresponding to the load of a vehicle, said first pressure-sensing piston being formed as a stepped piston having a large diameter portion and a small diameter portion.

3,936,098

DRIVE AND BEARING ASSEMBLY FOR A CONVERTER CONSTRUCTION

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 2, 1975, Ser. No. 538,139

Claims priority, application Australia, Jan. 10, 1974, 168/74

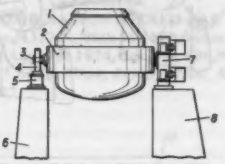
Int. Cl.² F16C *29/02*

U.S. Cl. 308—6 R **7 Claims**

1. In a drive and bearing assembly for a converter construction with a fixed bearing having a carrying trunnion supported therein and an expansion bearing, the improvement comprising:

a bushing forming the expansion bearing with recesses of semi-circular cross-section therein;

an axially movable trunnion supported in said bushing and having recesses of semi-circular cross-section therein, the



recesses in the bushing and the recesses in the trunnion complementing one another to form circular spaces;

torque transmitting crowned rollers being located in the circular spaces formed by the recesses; and

a driving toothed wheel being connected to said axially movable trunnion.

3,936,099

CONSTRUCTION OF BEARING BOXES

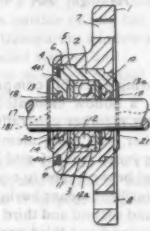
Hans Braun, Herbede, and Gerhard Mohn, Bergneustadt, both of Germany, assignors to Paul Kuhbier & Co., Wipperfurth, Germany

Filed Apr. 11, 1974, Ser. No. 460,066

Claims priority, application Germany, Apr. 14, 1973, 2318951

Int. Cl.² F16C *13/00*

U.S. Cl. 308—15 **16 Claims**



1. A bearing box comprising a plurality of shell sections substantially consisting of synthetic plastic material and jointly defining a recess for fitting bearing race means therein, and additional recesses coaxial with said recess for said bearing race means; and seal ring means in said additional recesses.

3,936,100

BEARING MOUNTING SYSTEM

Robert Gordon Moores, Jr., Cockeysville, and Richard Eugene Walton, II, Baltimore, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

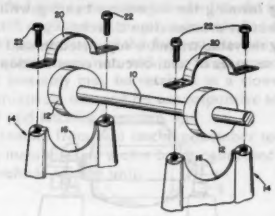
Filed July 2, 1974, Ser. No. 485,110

Int. Cl.² F16C *13/00*

U.S. Cl. 308—15 **23 Claims**

1. A system for mounting a pair of bearings which are on a common shaft, each of said bearings having an outer cylindrical surface, the combination comprising a bearing seat for each of said bearings, each of said bearing seats comprising means to form a substantially line contact with said bearing

outer cylindrical surface, and resilient hold down means cooperable with said bearing seats to resiliently secure each of said

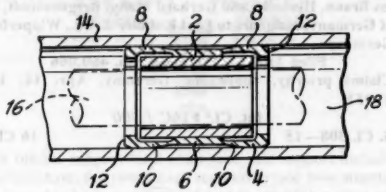


bearings between its respective seat and said hold down means.

3,936,101
COMPOSITE BEARING

Alexander Duncan McDonald, Portishead, England, assignor to Cam Gears Limited, Hitchin, England

Filed Aug. 19, 1974, Ser. No. 498,327
Claims priority, application United Kingdom, Aug. 30, 1973, 40788/73
Int. Cl.² F16C *27/00*
U.S. Cl. 308—26 **7 Claims**



1. A composite bearing assembly comprising a hollow elongated outer member, a hollow elongated inner member located within said outer member generally in axial alignment with said outer member, said inner member having its outer wall spaced from the inner wall of said outer member, and resilient means located between and in contact with said inner and outer walls, said resilient means having a first part bearing on one of said walls, and second and third parts bearing on the other said wall, said second and third parts being located one on each side of said first part along the axis of the bearing assembly.

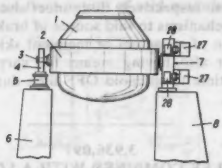
3,936,102
BEARING ASSEMBLY FOR ACCOMMODATING ANGULAR DISPLACEMENTS IN TORQUE-TRANSMITTING TRUNNIONS

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Jan. 2, 1975, Ser. No. 538,141
Claims priority, application Austria, Jan. 10, 1974, 169/74
Int. Cl.² F16C *23/00*
U.S. Cl. 308—72 **6 Claims**

1. A bearing assembly for accommodating angular displacements in a torque-transmitting trunnion, such as a converter-carrying trunnion, comprising

- a hub with a spherical face provided on the trunnion and having an external toothing following the spherical face,
- a trunnion-receiving bushing having a straight counter toothing meshing with the outer toothing of the hub, and
- a bearing container inner rings and outer rings provided between the bushing and the trunnion and having spheri-

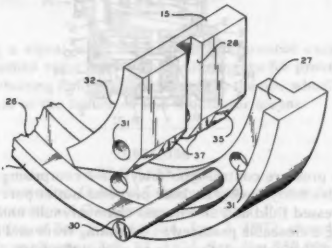


cal faces acting as mutual running faces, which running faces have a common center.

3,936,103
ROTARY SHAFT TILTING SHOE BEARING

Edson H. Byrns, Fayetteville, and James W. Endress, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,146
Int. Cl.² F16C *17/03, 23/04, 41/02, 43/02*
U.S. Cl. 308—73 **4 Claims**



1. A tilt shoe bearing assembly for establishing a hydrodynamic wedge between the shoes and a shaft, for rotatably supporting the shaft, including

a housing having an annular opening through which the shaft passes,

a stationary backing ring mounted within the housing opening encompassing the shaft, the inner surface of said ring forming a circular seat uniformly disposed about the shaft and having a centrally located annular rib radially extended toward the shaft,

a plurality of tilt shoe members circumferentially spaced within the ring, each shoe having a circumferential slot formed in the body thereof for loosely receiving said rib,

a pair of rocker pads formed upon the outer periphery of each shoe member positioned on either side of said slot and being arranged to ride in contact with the ring seat, the axial width of each pad being substantially less than the axial width of the shoe surface confronting the shaft with each pad being contoured to permit the shoe to move upon the seat in any direction,

a torque pin axially aligned with the shaft supported within the body of each tilt shoe and being arranged to pass through an opening formed in the annular rib whereby the shoe is prevented from moving with the shaft in the direction of shaft rotation, and

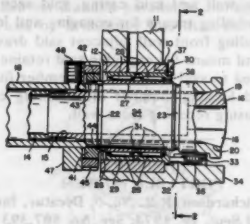
the rib and the circumferential slot formed in the shoe, and the pin and the opening formed in the rib, having a clearance therebewteen that is at least greater than the width of the hydrodynamic wedge whereby each shoe is free to adjust its relative position in regard to the shaft to accommodate the shaft as it deflects under load.

3,936,104

BEARING ASSEMBLY FOR SCREW MACHINE SPINDLE

Earl W. Brinkman, Rochester, N.Y., assignor to Davenport Machine Tool Division of Dover Corporation

Filed Jan. 28, 1975, Ser. No. 544,848
Int. Cl.[2] F16C *23/00, 35/08*
U.S. Cl. 308—151 7 Claims



1. An adjustable bearing assembly for rotatably journaling a spindle in a support, comprising

a first sleeve surrounding said spindle,

a second sleeve surrounding said first sleeve and secured in a bore in said support,

a plurality of bearing elements mounted for rolling movement between the confronting peripheral surfaces of said sleeves,

the inner peripheral surface of said first sleeve being truncated conical in configuration and being engaged with a complimentary truncated conical surface formed on the outer periphery of said spindle, and

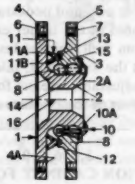
means on said spindle operable to shift said first sleeve axially on said spindle in a direction to cause said cooperating truncated surfaces to effect a slight radial expansion of said first sleeve.

3,936,105

BEARING WITH ONE OR MORE FLANGE-SHAPED RINGS

Sture Lennart Asberg, Goteborg, Sweden, assignor to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Filed Jan. 24, 1974, Ser. No. 436,318
Claims priority, application Netherlands, Feb. 9, 1973, 7301926
Int. Cl.[2] F16C *33/78*
U.S. Cl. 308—187.1 15 Claims



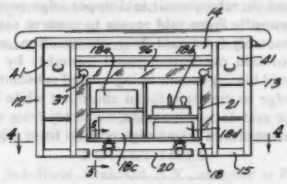
1. A bearing comprising an inner ring and an outer ring, at least said inner ring formed as part of a flange member, a plurality of rolling elements, said inner and outer rings being proportioned to have a maximum displacement with respect to each other for insertion of said rolling elements therebetween during assembly of said bearing, a bearing cage for caging said rolling elements between said inner and outer rings, and first and second sealing means for sealing first and second sides of said rolling elements for retaining lubricant between said rings and inhibiting penetration of foreign particles, said first sealing means being in place during insertion of said roller elements and including a relatively rigid portion and a relatively resilient portion, said rigid portion radially extending between said inner and outer rings over a distance not exceeding said maximum displacement, said resilient portion completing said first sealing means between said inner and outer ring.

3,936,106

COMBINATION STEREO-BAR

Ernest T. Harper, 4377 N. 90th St., Milwaukee, Wis. 53222

Filed Aug. 13, 1974, Ser. No. 496,960
Int. Cl.[2] A47B *77/04, 81/06, 87/00, 88/14*
U.S. Cl. 312—107 3 Claims



1. In a bar having a first support base, substantially vertical front and side walls and an open back, the improvement comprising:

second support base means adapted to fit substantially within said walls and within an opening in said first support base whereby said second support base means is isolated relative to said first support base and vibrations of said first support base will not be transmitted to said second support means,

sliding means mounted on said second support means for slidably supporting a sound system within said bar, said means being adapted to permit movement of said sound system between a first position within said walls and a second position outside of said bar,

said bar having a transparent window in at least one wall for viewing said sound system, and

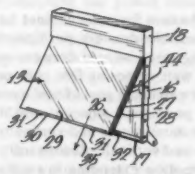
illuminating means mounted on said bar for accentuating said sound system.

3,936,107

DOOR CONSTRUCTION

William F. Gourdeau, and Ronald E. Hahn, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 16, 1974, Ser. No. 506,183
Int. Cl.[2] A47B *47/00*
U.S. Cl. 312—138 R 18 Claims



1. In a door construction for an electrically operable appliance, having a peripheral frame defining an opening, and electrical control means carried by said frame including wiring extending at the rear of said opening, the improvement comprising: a console enclosure carried at the top of said frame for enclosing the control means and defining a downwardly opening recess extending substantially fully across said opening; a

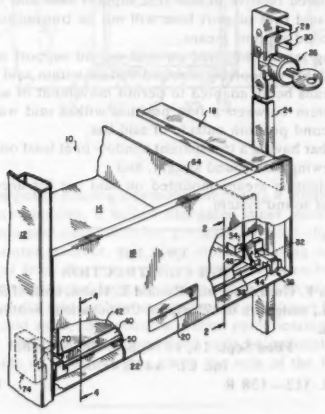
fire wall panel extending fully across said opening to close said opening forwardly of said control means and wiring; a plurality of decorative panels removably installed as an assembly in said frame across said opening spaced forwardly of said fire wall panel, said decorative panel assembly defining an upper edge portion received in said recess and a lower edge portion; cooperating male and female securing means on said frame and decorative panel assembly for securing said lower edge portion of the decorative panel assembly removably to said frame against movement forwardly from said space in an engaged disposition thereof; and biasing means for yieldably retaining said decorative panels in facial abutment in said assembly while permitting limited movement of said decorative panel assembly vertically from said engaged disposition to permit said lower edge portion to be moved forwardly from said space and thereby permit said upper edge portion to be moved downwardly from said recess to remove said decorative panel assembly from said door construction, and permit installation of said decorative panel assembly by a reverse procedure, said biasing means being spaced substantially from said lower edge to maintain facial abutment while being disposed to urge said decorative panel assembly from said frame upon movement of said lower edge portion from said engaged disposition.

3,936,108

FILE CABINET DRAWER LOCKING MECHANISM

John Alvin Chitester, Long Beach, N.Y., assignor to Oxford Pendaflex Corporation, Garden City, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,104
Int. Cl.² E05B *65/46*
U.S. Cl. 312—217 **9 Claims**



1. A locking mechanism for a file cabinet having a plurality of horizontally extensible drawers positioned one atop the other within a casing, each of said drawers having front and rear ends, a bottom wall, opposing first and second side walls, and a receding front wall being part of said casing, comprising:

an elongated rod positioned adjacent said drawer first side wall, means for moving said rod vertically upwardly to a locked position and vertically downwardly to an unlocked position, a projection extending inwardly from said rod towards said drawer first side wall;

a shaft supported beneath the front end of the drawer bottom wall and extending beyond said drawer first and second walls; means for rotatably supporting said shaft,

a first locking member rigidly mounted on said rotatable shaft and positioned between said first side wall and said rod, said first locking member including means for engaging and locking said drawer receding front wall adjacent said drawer first side wall and means cooperating with said projection for actuating said first locking member into locking engagement with said drawer receding front wall;

a retainer element attached to said casing adjacent said drawer second side wall and extending inwardly towards said drawer second side wall;

a second locking member positioned between said drawer second side wall and said casing, said second locking member including means for engaging and locking said casing receding front wall adjacent said drawer second side wall and means for engaging said retainer element;

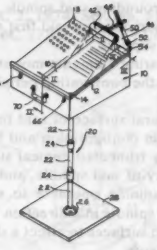
means attached to said first locking member for actuating said second locking member into locking engagement with said casing receding front wall.

3,936,109

PORTABLE PODIUM

Josephine M. Richardson, R.R. No. 5, Decatur, Ind. 46733

Filed Sept. 19, 1974, Ser. No. 507,393
Int. Cl.² A47B *27/00, 13/00*
U.S. Cl. 312—223 **5 Claims**



1. A podium structure comprising; a box-like upper part having bottom and side walls and also having a top wall which is inclined in the fore and aft direction, hinge means supporting one edge of the top wall on the side wall adjacent thereto for tilting of the wall to expose the inside of the said upper part, said top wall having an apertured region adjacent one side wall for transmission of sound to a recorder inside said upper part, a recorder support shelf pivotally connected to the back wall, said support shelf having a foldable stop flange connected thereto and adapted to engage the back wall for positioning the support shelf in position to receive the recorder, said support shelf and foldable stop flange adapted to be retracted to a closed position against the back wall of said upper part when not in use, and pedestal means for supporting said upper part adapted at the upper end for detachable connection to said bottom wall, said pedestal including a detachable base member at the lower end, said pedestal furthermore comprising axially adjustable means for varying the distance between said upper part of the podium and said base member.

3,936,110

COMBINATION CABINET FOLD-OUT BAR

Daniel H. Meggs, 4313 Vista Largo, and Janos Beny, 4445 Pacific Coast Highway, both of Torrance, Calif. 90505

Filed May 13, 1974, Ser. No. 469,130
Int. Cl.² A47B *85/00*
U.S. Cl. 312—241 **4 Claims**

1. A combination cabinet and fold-out bar comprising:

an upright cabinet having a generally rectangular front;

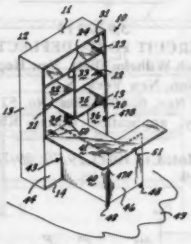
upper and lower doors hingedly mounted on said cabinet to lie flush with said front, when closed;

said upper door being of inverted L-shaped haviing a vertical leg, when closed extending upwardly along and closing one side of said cabinet and a horizontal leg, extending across and closing the upper part of said cabinet, the

lower edge of said vertical leg being hinged to said cabinet on a first and horizontal axis spaced upwardly from the bottom of said cabinet;

said lower door being hinged to said cabinet on a second and vertical axis intermediate the ends of said first axis and having a horizontal upper edge at substantially the elevation of said first axis; and

an extension panel hinged to an edge of said lower door on a third and vertical axis parallel to and spaced from said second axis by a distance less than the length of said



vertical leg and having an upper horizontal edge at the same elevation as that of said lower door whereby said lower door may be opened to extend perpendicular to said cabinet front, said extension may be swung to extend parallel to and spaced from said cabinet front and said upper door may be swung downwardly to a position wherein its vertical and horizontal legs rest on the upper edges of said lower door and extension, respectively, to define an L-shaped bar providing standing room between said horizontal leg and cabinet and easy access to the interior of said cabinet.

3,936,111

FURNITURE CONSTRUCTING KIT

Vittorio Mazzucconi, 22 Via Macchiavelli, Milan, Italy

Filed May 6, 1974, Ser. No. 466,868

Int. Cl.² A47B *43/00*; A47F *5/00*

U.S. Cl. 312—257 R **8 Claims**

1. A furniture construction kit comprising

1. at least two like elongated annular frame elements, each of the elements having an end and comprised of

a. an outer cylindrical tube and an inner cylindrical tube coaxial therewith,

b. the inner cylindrical tube having an internal thread at the end, and

c. axially continuous, diametrically opposed radial ribs interconnecting the cylindrical tubes, adjacent ones of the radial ribs defining axially extending spaces between the two cylindrical tubes and

2. a joint associable with the threads at the ends of the frame elements, the joint comprising

a. a ring means fitting between the ends of two of the frame elements, the ring means being comprised of an outer cylindrical tube and an inner cylindrical tube coaxial therewith, the inner tube of the ring means defining a central bore, axially continuous, diametrically opposed radial ribs interconnecting the cylindrical tubes of the ring means, adjacent ones of the radial ribs defining axially extending spaces,

b. a connecting pin having an externally threaded end for threaded connection with the internal thread at the end of one of the frame elements, the connecting pin fitting into the central bore of the ring means and being coaxially associable with the one frame element, and

c. a connecting member having an externally threaded shank for threaded connection with the internal thread at the end of the other one of the frame elements, the threaded shank being coaxially associable with the other frame element, the connecting member having a sector-shaped hook head extending eccentrically from the shank in a plane perpendicular to the shank axis for engagement in a selected one of the axially extending spaces in the ring means, the selected space having an aperture for receiving the hook head.

3,936,112

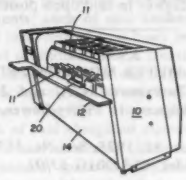
CRADLE SELECTOR CONTROLS FOR MOTORIZED ROTARY FILES

Richard P. Scholfield, Peekskill, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Clifton, N.J.

Filed Oct. 10, 1974, Ser. No. 513,545

Int. Cl.² A47B *49/00*; D06H *3/02*

U.S. Cl. 312—267 **3 Claims**



1. In a power driven file of the rotary type having a plurality of elongated record cradles, electric power means for moving the cradles one by one into position along the rear of an elongated operator shelf disposed across the the front of the file for access to records in the cradles, and electric selector control means controlling the power means for moving selected ones of the cradles into said position, a portion of the selector control means being exposed for operation by the operator, the improvement wherein said portion of the selector control means comprises an elongated pushbutton switch housing, means securing the housing along the rear edge of the operator's shelf for movement by and at the option of the operator along a fixed track between the ends of the shelf independently of the position of any of the cradles in the file, the housing carrying a plurality of pushbutton switches of the momentary contact-type with their pushbuttons exposed for operation by the operator, a pair of the switches being effective respectively to cause deactivation and reactivation of the power means independently of the remainder of the switches, the remainder of the switches constituting a group of switches each of which is electrically associated with one of the cradles, all of the switches being connected to a stationary portion of the file by an electrical cable movable with the housing.

3,936,113

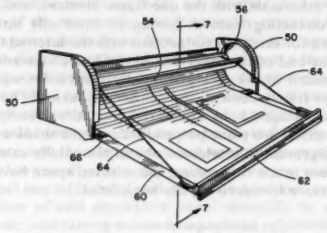
OVERSIZE DOCUMENT STORAGE CABINET

Paul R. Anderson, P.O. Box 3584, Sarasota, Fla. 33578

Continuation-in-part of Ser. No. 434,122, Jan. 17, 1974. This application May 19, 1975, Ser. No. 578,427

Int. Cl.² E06B 9/14; A47B 51/00

U.S. Cl. 312—297 12 Claims



1. A cabinet for storing oversize documents without folding, comprising:

a cabinet frame including a back mounting and a pair of cabinet ends having guide channels formed therein;

a flexible drawer mounted on said frame movable in said channels between a curled position storing said documents in a loosely curled state and an open position extending outwardly from the cabinet supporting said documents thereon in a flat state for easy viewing and selection;

inner document retaining means on said drawer for maintaining said documents in said loosely curled state in said closed position; and

outer document retaining means for retaining said documents on said drawer in said open position.

3,936,114

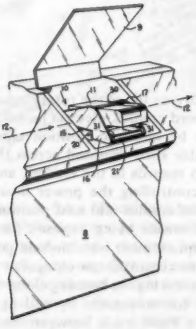
POSTAGE METER MOUNTING FIXTURE

Anthony Storace, Tarrytown, N.Y., and James Morabito, Bethel, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 12, 1975, Ser. No. 557,489

Int. Cl.² G01G 13/02

U.S. Cl. 312—311 5 Claims



1. A postage meter mounting fixture for mounting a postage meter to a mail-handling machine, said postage meter mounting fixture, comprising:

a housing for supporting a postage meter in a first postage printing position such that envelopes moving with a substantially vertical orientation through said mail-handling machine will be marked with postage by said postage meter said housing supporting said postage meter with a vertical orientation in said first position, and including pivot means operatively connected to the housing for pivoting the housing with respect to said mail-handling machine such that said postage meter will assume a second, disengaged position, means defining at least one elongated track extending along a length portion of said housing, and means connected to said postage meter for slidably moving said postage meter along said track when the meter is in said second disengaged position, said postage meter being slidably movable along said track from a first, generally inaccessible position to a second, accessible position.

3,936,115

START-UP CIRCUIT FOR A DEFLECTION SYSTEM

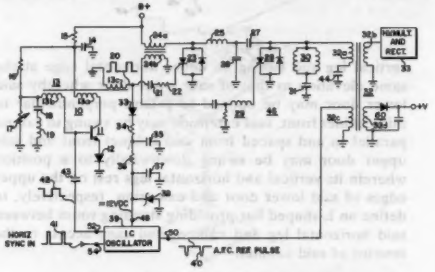
Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,422

Claims priority, application United Kingdom, Aug. 19, 1974, 36330/74

Int. Cl.² H01J 29/70, 29/76

U.S. Cl. 315—399 5 Claims



1. In a deflection system a start-up circuit comprising:

a deflection generator including a first oscillator which produces a first signal for producing a deflection signal in a deflection winding in response to said first signal;

second oscillator means coupled to said first oscillator for controlling the frequency and phase of said first oscillator; and

rectifying means coupled to said deflection means and to said second oscillator for providing a direct current operating potential to said second oscillator when said deflection signal is being produced.

3,936,116

COAXIAL HF MULTIPLE ROTARY CONNECTION

Georg Spinner, Erzgie Bereistr, 33, 8 Munich 2, Germany

Filed June 12, 1974, Ser. No. 478,527

Claims priority, application Germany, June 15, 1973, 2330585

Int. Cl.² H01R 39/00

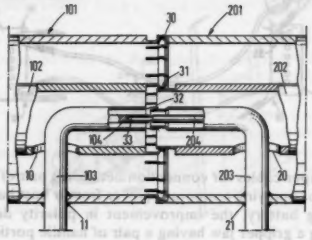
U.S. Cl. 339—8 R 5 Claims

1. A rotary assembly of HF coaxial cables, with a portion of one of the cables being inside the other of the cables, comprising;

an internal coaxial cable having a first internal conductor and a first external conductor outside said first internal conductor; said internal cable having a first portion of a first length and said first portion being inside an external coaxial cable;

an external coaxial cable having a hollow second internal conductor; said second internal conductor having a second portion of at least said first length and said second portion having a cross section greater than the cross section of said first external conductor; said external cable having a second external conductor outside said second internal conductor;

said internal cable first portion being located inside said second internal conductor second portion; beyond both ends of its said first portion, said internal cable passing from within said second internal conductor through both said second internal and external conductors to without said external cable, whereby said internal cable serves as a reactance in said external cable; said first external conductor being electrically connected to said second external conductor at both locations along said internal



cable where said internal cable passes through said second external conductor;

said internal cable first portion being separated into two sections, first rotary coupling means separably joining both of said internal cable first and second conductors in said internal cable first portion;

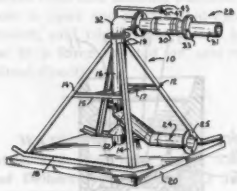
said external cable second portion being separated into two sections, second rotary coupling means separably joining both of said external cable second internal and external conductors in said external cable second portion.

3,936,117

IRRIGATION PIVOT STAND CONSTRUCTION

Richard F. Reinke, Reinke Manufacturing Company, P.O. Box 480, Deshler, Nebr. 68340

Filed Sept. 10, 1974, Ser. No. 504,808
Int. Cl.² H01R *39/00*
U.S. Cl. 339—8 R **6 Claims**



1. A pivot stand for circular irrigation systems comprising:

a frame adapted to be disposed on a supporting surface;

a stationary water supply pipe having a pipe end portion directed vertically upwardly with respect to said surface and mounted on said frame in spaced relationship to said supporting surface;

a rotatable water delivery pipe extending radially outwardly from said end portion and having a downwardly directed segment rotatably coupled with said end portion;

a rotatable conduit containing a plurality of electrical control conductors, said conduit being coupled with said delivery pipe for rotation therewith and having a vertical portion passing in through said end portion and out through said segment;

a slip ring assembly enclosing a plurality of slip rings mounted beneath said end portion;

a plurality of wiping contacts disposed for electrical contact with said slip rings within said housing,

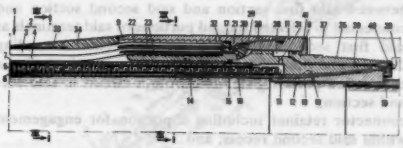
one of said contacts and said slip rings coupled with said electrical control conductors and the other of said contacts and said slip rings coupled with an external power supply whereby to supply electrical current to the electrical control conductors.

3,936,118

COUPLING FOR FLEXIBLE PIPE PROVIDED WITH REINFORCING ARMOURINGS

Jean Thiery, Le Pecq, and André Chevalier, Pantin, both of France, assignors to Institut Francais du Petrole, France

Filed May 3, 1974, Ser. No. 466,851
Claims priority, application France, May 14, 1973, 73.17436
Int. Cl.² H01R *3/04*; F16L *39/02*
U.S. Cl. 339—16 R **32 Claims**



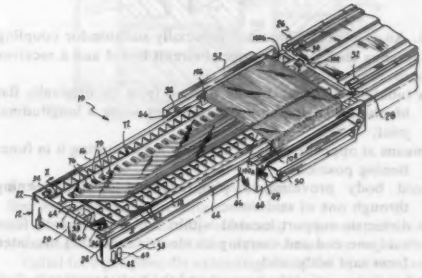
1. A coupling for a flexible pipe provided with at least one armouring withstanding tractive and/or torsional stresses applied to the pipe, the armouring comprising at least one layer of helically wound reinforcing elongated elements, said coupling comprising in combination a tubular body member, an anchoring ring surrounding said body member on at least one portion thereof, said body member and said anchoring ring delimiting an annular space of limited length in which the end of said armouring is positioned, and a plurality of elongated anchoring elements, each of said anchoring elements being integral with at least one of said body member and said anchoring ring and positioned with a clearance, over at least a portion of the length of said annular space, between two adjacent reinforcing elements constituting said armouring, said annular space being filled with a solidified material which adheres to each of said elongated elements constituting said armouring and to said anchoring elements and to the internal surface of said annular space thereby making said armouring and coupling integral with each other.

3,936,119

TERMINAL BLOCK HAVING FLAT FLEXIBLE INTERCONNECTING CIRCUITS

George Edward Ayer, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 16, 1974, Ser. No. 433,630
Int. Cl.² H01R *13/46*
U.S. Cl. 339—17 F **6 Claims**



1. A terminal block comprising:

a housing including a flat portion having a plurality of slots therethrough, a pair of spaced outside walls extending above said flat portion, a pair of elongate grooves in respective ones of said outside walls, a first recess in one of said outside walls, a second recess in said one outside wall adjacent said first recess, and a cover including a pair of spaced projections slidably received in respective ones of said elongate grooves;

a plurality of terminals carried by said housing, said terminals extending through said slots and each terminal including an insulation-piercing portion disposed outside of said housing for connection to a conductor and a second portion within said housing below the extent of said outside walls;

a flat circuit member mounted within said housing, said flat circuit member including a first longitudinal section of one dimension and a second longitudinal section of smaller dimension and a plurality of circuits extending between said first section and said second section and connected to selected second portions of said terminals at said first section with said second section extending through said first recess, said circuit member including a connection portion extending from a circuit in said second section;

a connector retainer including a portion for engagement within said second recess; and

an electrical connector connected to said retainer, said connector including contacts connected to said connection portion of said flat circuit member extending through the adjacent first recess.

3,936,120

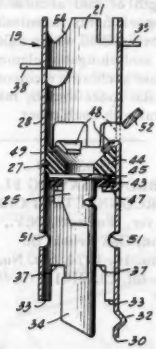
ANTENNA CONNECTOR

Ronald L. Schultz, Northfield, Ill., assignor to Chromalloy-Alcon, Inc., Chicago, Ill.

Filed July 26, 1974, Ser. No. 492,242

Int. Cl.² H05K *1/00*; H02B *1/02*; H01R *9/08*

U.S. Cl. 339—17 M **19 Claims**



1. An electrical connector especially suitable for coupling an antenna leadin with a printed circuit board and a receiver chassis, comprising:

a tubular sheet metal body formed from an originally flat blank and having confronting edges along a longitudinal joint;

means at opposite ends of the body for mounting it in functioning position;

said body providing a plug-receiving socket opening through one of said ends;

a dielectric support located within said body spaced from said one end and carrying an electrical contact insulated from said body; and

means connecting the support and the body together including a mechanical interlock retaining the body against spreading open at said joint in the vicinity of said support.

3,936,121

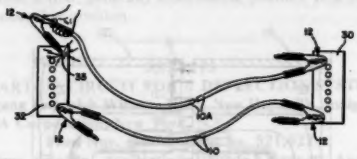
JUMPER CABLES FOR SPARKLING POLARITY INDICATOR

Gerhard Karl Leinberger, 505 E. Schantz Ave., Dayton, Ohio 45409

Filed Aug. 19, 1974, Ser. No. 498,391

Int. Cl.² H01R *11/22*

U.S. Cl. 339—29 B **4 Claims**



1. In jumper cables for connection between a pair of storage batteries for applying temporary power from a host battery to a receiving battery, the improvement in polarity detection comprising a gripper jaw having a pair of handle portions and in which one of the connecting cables is attached to one of said portions, a length of coiled resistance wire attached to the other of said handles, said length of wire being essentially self-supporting and extending outwardly of said handle and terminating in an exposed end and having a resistance with the handle in the other of 0.5 ohm to 4 ohms, the end of said wire providing a testing point which sparkles when touched to a battery terminal in which the jumper cables have been incorrectly connected to provide a visual indication of such incorrect connection.

3,936,122

SAFETY DEVICE IN ELECTRICAL CONNECTION DEVICES

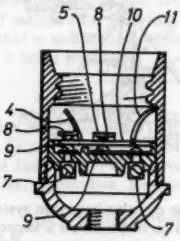
Anders Torvald Sverker Hagelberg, Molnlycke, Sweden, assignor to Bengt Petersson New Products Investment AB, Sweden

Filed Aug. 29, 1974, Ser. No. 501,820

Claims priority, application Sweden, Aug. 30, 1973, 73117764

Int. Cl.² H01R *13/44*

U.S. Cl. 339—41 **7 Claims**



1. Safety device in electrical connection devices, especially lamp sockets, comprising a plurality of contact parts having portions provided to rest against an object arranged to be connected to the connection device, a plurality of contact elements, equal in number to said contact parts, one of said contact parts cooperating with one of said contact elements to form a connection, said contact elements being connected to the electrical leads of a cable, each of said contact parts comprising biasing means for urging said contact parts away from said contact elements, and at least one insulating member mounted between said contact parts and said contact elements for separating all of said contact parts from all of said contact elements when there is no object in said connection device, said insulating member comprising means for moving said insulating member so as to allow said contact parts and ele-

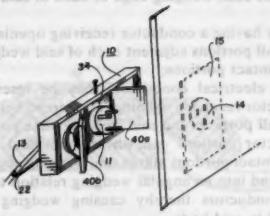
ments to contact each other in response to the insertion of an object into said connection device.

3,936,123

ELECTRICAL PLUG EJECTING APPARATUS

Willie P. Gossett, 13621 Far Hills, Dallas, Tex. 75240, and Robert F. White, Box 479, Mount Vernon, Tex. 75457

Filed Oct. 23, 1974, Ser. No. 517,219
Int. Cl.² H01R 13/62
U.S. Cl. 339—45 M 5 Claims



1. An electrical plug ejecting mechanism, comprising:
a. an ejector housing defined by front and rear longitudinally extending wall portions, a centrally defined opening in said housing extending transverse to said longitudinal direction and through said front and rear wall portions,
b. means for retaining an electrical plug within said opening in a manner that allows the conductive prongs of said plug to forwardly extend from said front wall portion,
c. a pair of compartments within said housing longitudinally spaced from one another on opposite sides of said centrally defined opening,
d. a pair of ejector springs respectively disposed within said compartments,
e. a pair of doors forming a part of said front wall portion so mounted to said housing to respectively close off said compartments and maintain said ejector springs under compression when in such closed position,
f. latch means latching said doors in said closed position, and
g. trip release means including a trip lever for releasing said latch means from said latching position, thereby to allow said doors to open and release said ejector springs from compression, said trip release means being actuated in response to a force exerted on said trip lever in said longitudinal direction.

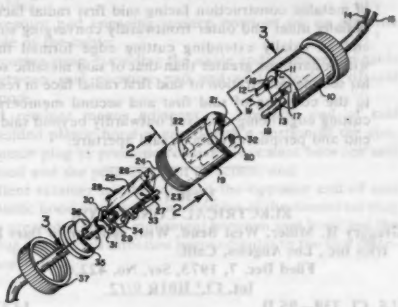
3,936,124

WATERPROOF CONNECTOR

John D. Tuttle, 198 Rivo Alto Canal, Long Beach, Calif. 90803, and Delbert J. Wagner, 7333 Jackson St., Paramount, Calif. 90723

Filed Nov. 1, 1974, Ser. No. 520,158
Int. Cl.² H01R 11/02
U.S. Cl. 339—60 M 3 Claims

1. A waterproof connector for electrical wires comprising, in combination;
a. an insulative plug body having first and second conductive blades extending from a front face thereof and separated by a given distance, each of said blades having an insulated skirt portion about its base at the point it exits from said front face, said skirt tapering towards a smaller size as it extends from the surface to terminate approximately at a mid-point of the blade, the inner ends of the blades within the plug body connecting to electrical wires passing from an opposite end of said plug body;
b. an insulative socket body of resilient material having a channel of rectangular cross section opening out at a front face and extending into said socket body a given length to terminate within said body, the remaining portion of said body defining an interior hollow chamber opening out at an opposite end of the body of greater cross sectional dimensions than said channel;
c. an electrical contact supporting member of resilient material having a rectangular cross section corresponding to that of said channel and a length greater than the length of the channel so that it can be force-fitted in said channel with the front end of said supporting member coplanar with the front face of said insulative socket body and a rear portion of said member protruding into said hollow chamber; and
d. electrical contact surfaces embedded in opposite forward sides of said member and internally connecting to terminals in opposite rear sides of said member for receiving electrical leads passing into said opposite end of said body, the width of the channel corresponding to said given distance between the conductive blades of said plug and the forward opposite inner walls of said channel being tapered inwardly slightly, whereby said blades can be urged into said channel to straddle opposite sides of said member, the resilient material of the insulative socket body and member together with the tapering inwardly of the channel walls exerting a squeezing action on the blades to wipe them clean of water and moisture, said skirts on the blades plugging the channel entrance sides to effect a waterproof connection.

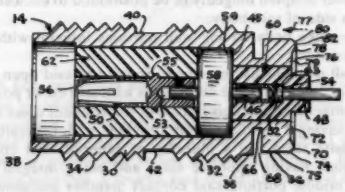


3,936,125

ELECTRICAL CONNECTOR WITH METAL TO METAL SEAL

Harold Gregory Hutter, Brookfield, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 28, 1974, Ser. No. 437,277
Int. Cl.² H01R 7/02
U.S. Cl. 339—94 C 17 Claims



1. An electrical connector comprising:
first and second connecting members;
the first member including a housing with an aperture, a mating section of metallic construction having a first radial face peripherally extending about the aperture, and a shroud member axially extending from said first face towards the second member and generally parallel to the aperture to define an enlarged opening.

the second member including a sleeve having an interior and a mating portion, and contact means carried by said sleeve and arranged to extend into said aperture in response to the receipt of said mating portion in said enlarged opening, and

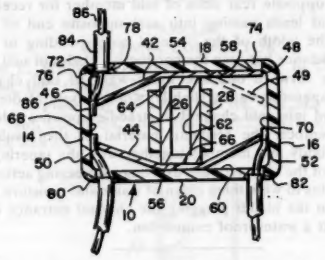
means for coupling said first and second members in conjunction with the movment of said mating portion axially within said shroud member, said mating portion including a front section of reduced outer diameter and a radial flange having an inner end rigidly fixed on the front section and at least one deflectable integral beam section extending outwardly therefrom for engagement with said first radial face, said one beam section having a portion of metallic construction facing said first radial face with radially inner and outer frontwardly converging surfaces and an axially extending cutting edge formed thereby with a hardness greater than that of said metallic section for sealing penetration of said first radial face in response to the coupling of said first and second members, said cutting edge being disposed outwardly beyond said inner end and peripherally about said aperture.

3,936,126

ELECTRICAL CONNECTOR

Gregory H. Miller, West Bend, Wis., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Dec. 7, 1973, Ser. No. 422,617
Int. Cl.² H01R 9/12
U.S. Cl. 339—95 D **14 Claims**



1. An electrical connector comprising:

a housing and a contact member;

said housing made of plastic material having formable and deflectable character;

said housing having a box like body and a cover;

a hinge structure integral with and interconnecting said body and said cover;

said box like body having an open side and a closed side;

said cover adapted hingedly to be positioned to enclose said open side of said body;

said box like body having wall portions integral with said closed sides;

said wall portions having edges disposed at said open side;

said edges adapted to be contiguous with said cover portion;

said contact member being made of flat resilient sheet metal and having a middle portion provided with generally flat opposite sides and a plurality of generally flat contact portions having opposite sides and being integral with said middle portion, said contact member positioned in said body by a pair of first projections extending from said closed side of said box like body;

said pair of first projections holding said middle portion of said contact member in fixed position adjacent said closed side of said body and thereby preventing substantial movement of said contact member in directions longitudinally of said contact portions;

second projections integral with said cover and disposed between said pair of first projections extending from the closed side of said body;

said second projections holding said middle portion of said contact member adjacent to said closed side of said body;

said contact portions having said opposite sides disposed generally at right angles to said opposite sides of said middle portion;

said body having wall portions substantially parallel with said opposite sides of said flat contact portion;

said contact portions each having a conductor contacting and wedging edge;

a conductor engaging wall portion of said body closely adjacent each wedging edge of each of said contact portions;

said body having a conductor receiving opening in some of said wall portions adjacent each of said wedging edges of said contact portions;

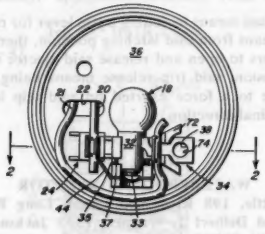
whereby electrical conductors may be inserted through conductor receiving openings and forced between respective wall portions and said wedging edge portions of said conductor portions and whereby resilient character of said contact portions allows said wedging edge portions to be forced into an angular wedging relation to the respective conductors thereby causing wedging entrapment thereof in said body.

3,936,127

LAMP MOUNTING ASSEMBLY

Charles R. Morrison, Frewsburg, N.Y., assignor to Truck-Lite Company, Inc., Jamestown, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,639
Int. Cl.² H01R 13/38
U.S. Cl. 339—97 L **6 Claims**



1. In combination with a lamp reflector having a receptacle formation partially surrounding and frictionally retaining a lamp bulb adapted to be electrically connected to an insulation covered conductor, retainer means projecting from the reflector in spaced relation to said receptacle formation, connector means seated in said retainer means for piercing insulation of a conductor inserted therein to electrically connect the same to the bulb, and a contact arm extending from the connector means and positioned by the receptacle formation for operative engagement with the bulb, said connector means including a pair of insulation piercing elements, a web portion interconnecting said elements in spaced relation and in abutment with the receptacle formation, and a bulb base embracing strap extending from the web portion into the receptacle formation.

3,936,128

SOLDERLESS ELECTRICAL CONNECTOR FOR CONNECTING A PLURALITY OF INSULATED WIRES

Anthony Thomas D'Annessa, Marietta, Ga.; Paul Rudolph Gustin, Baltimore, Md.; Donald Tolman Smith, Norcross, and Janis John Zalmans, Atlanta, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,816

Int. Cl.² H01R *13/38*

U.S. Cl. 339—98 12 Claims

12. A connector comprising:

a cap and a body;

said body including at least two wire entrances formed between at least three protruding parallel fins adjacently joined by slotted webs, a wire lead-in ramp from each said entrance ending in a circular opening to an interior encapsulant-filled void, a depressed nub beyond each said opening midway across said void, further wire support means at the void far side, a wire when first placed across said support means being in noncontacting relation with the end of said nub and therefore being fully surrounded with said encapsulant;

said cap including slotted beam wire-bridging members, means for snap-mounting to said body, and means for snubbing inserted wires down between said fins and into said webs for strain relief.

3,936,129

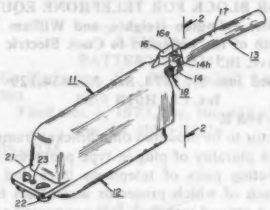
MOLDED PLASTIC HOOD ASSEMBLY FOR A CABLE CONNECTOR PLUG

Rodney J. Guy, Boulder, Colo., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,646

Int. Cl.² H01R *13/58*

U.S. Cl. 339—103 R 9 Claims



1. A molded plastic hood and connector plug assembly, which comprises:

a hood body having an extension adjacent one end thereof;

a flexible tongue integrally connected to said extension on said body and projecting laterally therefrom;

a pressure pad integrally connected to said flexible tongue element in spaced relationship to said extension on said body;

molded rigid retainer means adjacent an opposite end of said body engaged with a portion of the connector plug to preclude relative movement between the hood and the plug in a first direction; and

molded resilient retainer means adjacent the opposite end of said body engaged with a portion of the connector plug to preclude relative movement between the hood and the plug in a second direction perpendicular to the first direction.

5. A protective assembly including a cable connector plug, which comprises:

a molded plastic hood having portions of the connector plug and of a cable connected to the plug received therein, said hood including an extension adjacent one end thereof engaging surface portions on one side of the cable;

a pressure pad engaging surface portions on an opposite side of the cable;

a securing strap encircling the cable and gripping the cable between said pressure pad and said extension of said hood;

rigid retainer means adjacent an opposite end of said molded plastic hood engaged with a portion of the connector plug to preclude relative movement between said hood and the plug in a first direction; and

resilient retainer means adjacent the opposite end of said plastic hood engaged with a portion of the connector plug to preclude relative movement between said hood and the plug in a second direction perpendicular to the first direction.

3,936,130

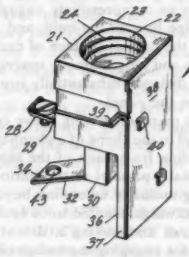
PLUG-IN FUSE RECEPTACLE INTERCHANGEABLE WITH CIRCUIT BREAKER

Albert Graham, Toronto, and Norman Henry McCullough, Weston, both of Canada, assignors to I-T-E Circuit Breaker (Canada) Limited, Canada

Filed July 1, 1974, Ser. No. 484,682

Int. Cl.² H02B *1/02*

U.S. Cl. 339—125 R 9 Claims



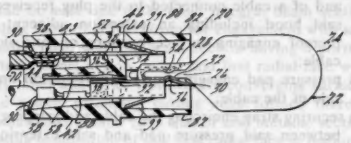
1. A fuse receptacle including an insulating generally rectangular parallelopiped body having a recess formed into an upper surface of the body and having at least one pair of opposed plane-surfaced sides, a screw-type socket disposed completely within said recess and constituting a first fuse engaging terminal, a second fuse engaging terminal disposed within said recess at the bottom thereof, first means external of said body for mechanically securing said receptacle to a circuit breaker mounting rib in a panelboard constructed to receive circuit breakers with one of said plane-surfaced body sides adjacently parallel to an exterior surface of said mounting rib, line and load terminals disposed externally of the remaining one of said pair of plane-surfaced sides and a bottom of said body, and second means conductively connecting said line and load terminals to the respective first and second fuse engaging terminals.

3,936,131

SNAP-IN ASSEMBLY AND CONTACT TERMINAL FOR WEDGE BASE LAMPS

Remie P. Durand, Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation-in-part of Ser. No. 343,339, March 21, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,770
Int. Cl.² H02B 1/02; H01R 13/42
U.S. Cl. 339—128 10 Claims



1. A snap-in socket assembly for receiving, locating and positioning within an aperture in a mounting panel a wedge bulb having a pair of filament extension wires positioned externally on opposite sides of the wedge base and overlying a pair of in-line troughs extending transversely to the wedge base, said socket comprising:

an elongated tubular electrically non-conductive housing,

a rib within said housing and longitudinally extending from substantially near one end to the other end of said housing and dividing said housing into two sections,

a radially extending rim girding said housing at said other end,

at least two opposed resilient jaw members cantileverly supported from said other end of said housing and extending from said rim, said jaw members having a C-shaped cross section centered on either side of the plane defined by said rib,

a pair of elongated electrically conductive contact members each located in a different one of the said housing sections and extending between said opposed resilient jaws which compressively engage said contact members upon the insertion of the bulb therebetween and cause the contact members to compressively engage the filament wires on the wedge base of the bulb, and

a protuberance on the outside surface of each of said resilient jaw members and longitudinally spaced from said rim a predetermined distance substantially equal to the depth of the aperture in the panel,

each of said contact members having a wire contact end and a bulb contact end in the shape of a channel having a wing outwardly extending from each of the side walls of said channel substantially parallel to the bottom web of said channel and longitudinally extending beyond the end of said channel, said wings adapted to be located in both of said C-shaped jaws and having a detent protuberance thereon adapted for engaging the trough on the bulb, said wings of each of said contact members positioned within said jaws opposing the wings of the opposite contact member.

3,936,132

COAXIAL ELECTRICAL CONNECTOR

Harold Gregory Hutter, Brookfield, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 327,868, Jan. 29, 1973, abandoned. This application Sept. 6, 1974, Ser. No. 503,948
Int. Cl.² H01R 17/18; H02B 1/02
U.S. Cl. 339—130 C 11 Claims

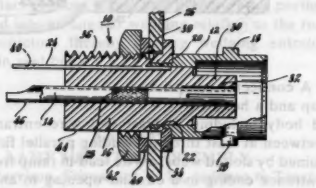
1. A coaxial electrical panel connector adapted to be mounted in a panel having opposite surfaces with an opening communicating said opposite surfaces for supporting another coaxial connector from said panel and for enabling the extension of an electrical connection from the inner conductor and outer conductor of said other coaxial connector through said panel without electrical engagement with said panel, the improvement comprising:

an outer annular contact having a terminating annular rear end and a forward portion for engagement with the outer conductor of said other coaxial connector;

a conductive lead of substantially smaller cross section than said outer contact connected to said terminating rear end and extending rearwardly therefrom for passage through said opening;

an inner contact extending axially of said outer annular contact in radially spaced relationship to said outer contact and conductive lead with one end of said inner contact arranged for engagement with the inner conductor of said other coaxial connector and the other end of said inner contact arranged for passage through said opening;

a one piece body of insulating material passing through said opening and molded in encircling fixed relationship about



both said inner contact and said conductive lead with said body having an integral outer forward portion in molded engagement with the outer periphery of said terminating rear end and an integral inner forward portion in molded engagement with the inner periphery of said terminating annular rear end to secure and support said outer contact from said panel with a dielectric mating face on said body extending into said outer contact and the forward portion of the outer contact extending forwardly of both the outer forward portion and the inner forward portion of said body, a continuous annular radial shoulder intermediate the ends of said body integrally interconnecting said outer annular forward portion and said inner annular forward portion,

and a flange integrally formed on said body extending radially outwardly of said outer conductor for abutment with one surface of said panel to prevent engagement between said panel and outer contact.

3,936,133

CONNECTOR BLOCK FOR TELEPHONE EQUIPMENT

Frank G. Splitt, Arlington Heights, and William P. Frantz, Chicago, both of Ill., assignors to Cook Electric Company, Morton Grove, Ill.

Filed Jan. 17, 1974, Ser. No. 434,129
Int. Cl.² H01R 9/00
U.S. Cl. 339—198 R 4 Claims

1. A connector to be mounted on a bracket frame structure for mounting a plurality of plug-in type protector assemblies used in protecting pairs of telephone lines and telephone equipment, each of which protector assemblies having line terminals and a ground terminal, said connector comprising:

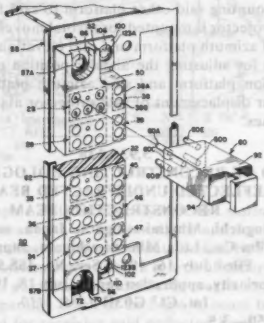
an elongated mounting panel having first and second elongated sided edges, a first mounting end portion at one end of the panel and a second mounting end portion at an opposite end of the panel, and first and second opposed mounting faces,

a plurality of socket groups arranged in a single column along said mounting panel adjacent said first elongated side edge, each of said socket groups have an array of sockets conforming to said array of line terminals and ground terminal so as to mount one of said protector assemblies in each of said socket groups,

a plurality of terminal hole groups arranged in a single column along said mounting panel adjacent said column of socket groups and adjacent said second elongated side edge, each of said terminal hole groups being adjacent and associated with one of said socket groups,

a ground terminal contact means insertable into one of said sockets in each of said socket groups, each of said ground terminal contact means having a receptacle portion in said mounting panel to receive said ground terminal of said protector assembly, and a holding portion extending from said second face of said mounting panel,

a first ground plate mounted along said second face of said mounting panel at said first end portion, said first ground plate having a first bracket means extending from said second face of said mounting panel and in alignment with said holding portions of each of said ground terminal contact means,



a second ground plate mounted along said second panel face at said second end portion and having a second bracket means in alignment with said first bracket means and said holding portions,

ground bus bar means extending along said second face and connected to each of said holding portions of said ground terminl contact means and said first and second bracket means of said first and second ground plates,

a mounting hole in each of said first and second mounting end portions,

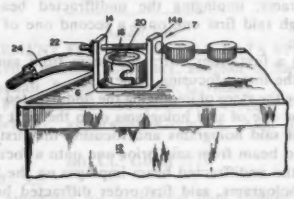
a fastener insertable through each of said mounting holes to connect said mounting panel to said bracket frame structure,

and a ground hole in each of said first and second ground plates in coaxial alignment with each of said mounting holes.

3,936,134
BATTERY CLAMP

Anthony G. Piscionere, Sr., 902 Kimball Ave., Bronxville, N.Y. 10708

Filed Oct. 4, 1973, Ser. No. 403,637
Int. Cl. H01r *11/26*
U.S. Cl. 339—235 2 Claims

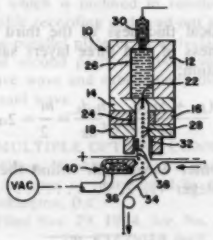


1. A battery clamp comprising, in combination, a cylindrical-shaped laterally constrictable clamping member of springy material for clamping about a battery smooth post extending, therethrough, a battery cable secured to an outer wall of said clamping member, a U-shaped member formed with a perforated base for receiving said battery post in engagement with said base, a pair of spaced constrictable arms extending upwardly of said base, said arms being spaced to clear said battery post and said clamping member, said clamping member being positioned between said arms, with the clamping member in alignment with the perforation in said base for receiving said battery post, and means for constricting said arms about said clamping member.

3,936,135
CATCHING APPARATUS AND METHOD FOR JET DROP RECORDING

Peter L. Duffield, Kettering, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 277,999, Aug. 4, 1972, abandoned. This application June 5, 1974, Ser. No. 476,384
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—1 9 Claims



1. In a jet drop recording system an improved method of catching selected drops from a parallel row of drop streams comprising the steps of:

1. directing said drops toward a vertically oriented drop catching face provided with a capillary slot extending substantially the full length thereof,
2. establishing a continuous meniscus of recording liquid across the entrance to said slot, and
3. drawing away recording liquid which runs downwardly toward said slot by applying across the mouth of said slot a pressure differential great enough for removal of said liquid but less thana an amount equal to twice the liquid surface tension divided by the slot width.

3,936,136
MULTILAYER ANTI-REFLECTION FILM FOR ULTRAVIOLET RAYS

Hideo Ikeda, Kamakura, and Hideki Akasaka, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 211,175, Dec. 23, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 416,826
Claims priority, application Japan, Dec. 29, 1970, 45-120942
Int. Cl.[2] G02B *5/28*
U.S. Cl. 350—1 7 Claims

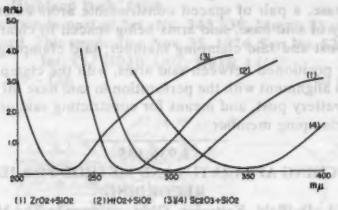
1. An anti-reflection film for ultraviolet rays comprising:

a substrate having a refractive index in the range of 1.6–1.4 and being transparent to the ultraviolet range; and a three-layer film consisting of

a. a first-layer having a refractive index n_1 in the range of 1.3–1.5 and an optical thickness n_1d_1 and being adjacent to air, where d_1 is a physical thickness of the first layer,

b. a second layer adjacent to said first layer and having a refractive index n_2 in the range of 1.6–1.7 and an optical thickness n_2d_2, where d_2 is a physical thickness of the second layer, and

c. a third layer disposed between said substrate and said second layer and having a refractive index $(n_1 + \Delta n)$



and an optical thickness $(n_1 + \Delta n)d_1$, wherein Δn has the relation:

$$|\Delta n/n_1| < 0.1$$

$n_1 d_3 = (n_1 + \Delta n)d_1$, and

$\Delta n > 0$, and

d_1 is a physical thickness of the third layer, said optical thickness of said three layers satisfying the following relation:

$$\frac{n_1 d_3}{\lambda s} + \frac{(n_1 + \Delta n)d_1}{\lambda s} = \frac{n_2 d_2}{\lambda s} = \frac{m}{2} = 2\alpha$$

where λs is the center wavelength within the ultraviolet range and m is integer (1, 2, 3.....), and the following relation:

$$|\cos G| \simeq \sqrt{n_1/(n_1 + n_2)}$$

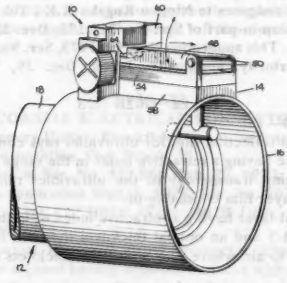
where $G = 2\pi\alpha \cdot \frac{\lambda s}{\lambda}$, and

λ is a specific wavelength in the far peripheral range of $450m\mu$–$500m\mu$ or $150m\mu$–$180m\mu$, wherein an equivalent refractive index N of said three-layer film is in the range of 1.35–1.3 for the central ultraviolet range ($225m\mu$–$350m\mu$), less than 1.3 for the peripheral range ($200m\mu$–$225m\mu$ and $350m\mu$–$400m\mu$) and nearly zero at the specific wavelength λ.

3,936,137
ILLUMINATED RETICLE PROJECTION SYSTEM

Alan Litman, Pittsburgh, Pa., assignor to Smith & Wesson Chemical Company, Inc., Rock Creek, Ohio

Filed July 3, 1974, Ser. No. 485,559
Int. Cl.² G02B 27/32
U.S. Cl. 350—10 **6 Claims**



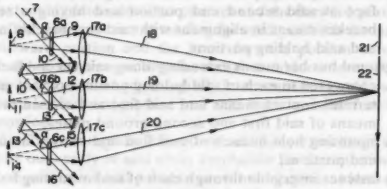
1. An illuminated reticle projection system for night vision equipment having an objective lens assembly comprising:

a frame having means for securement to the night vision equipment and carrying a reticle projector including a light source, a reticle mask and a projection lens, said light source being disposed to illuminate said reticle mask to project a reticle image, said projection lens having optical properties to project the reticle image at a substantially infinite conjugate into the entrance pupil of the objective lens assembly, an azimuth platform carried by said frame, means for pivotally mounting said azimuth platform for movement about a vertical axis, an elevation platform carried by said frame, means for pivotally mounting said elevation platform for movement about a horizontal axis, means coupling said reticle projector to one of said azimuth platform and said elevation platform for pivotal movement with said one platform about its axis, the mounting means for said one platform pivotally mounting said one platform to the other of said platforms, the mounting means for the other of said platforms pivotally mounting said other platform to said frame whereby said projector is mounted for pivotal movement with each of said azimuth platform and said elevation platform, and means for adjusting the angular position of each of said elevation platform and said azimuth platform to effect angular displacement of said projector about the respective axes.

3,936,138
METHOD OF RECONSTRUCTING HOLOGRAMS USING A REFLECTED UNDIFFRACTED BEAM AS A RECONSTRUCTION BEAM

Masaru Noguchi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 16, 1974, Ser. No. 488,945
Claims priority, application Japan, July 18, 1973, 48-81549
Int. Cl.² G03H 1/24, 1/30
U.S. Cl. 350—3.5 **5 Claims**



1. A method of reconstructing a holographic image on an image-focusing plane by focusing first-order diffracted beams from holograms comprising the steps of:

preparing a plurality of substantially identical holograms of an object;

arranging said plurality of substantially identical holograms located in a plane with spaces therebetween which spaces are large enough to unobstructedly pass a first-order diffracted beam from each said hologram to an image-focusing plane;

impinging a reconstructing beam onto a first one of said holograms; impinging the undiffracted beam passing through said first one onto a second one of said holograms;

focusing a first-order diffracted beam from said first one onto the image-focusing plane;

repeating the steps of impinging the undiffracted beam from a prior one of said holograms onto the next succeeding one of said holograms and focusing the first-order diffracted beam from said prior one onto a focusing plane until the undiffracted beam impinges on the last one of said holograms, said first-order diffracted beams from holograms being focused in the same region of the focusing plane so that the images reconstructed by the diffracted beams from different holograms are substantially

registered with each other, whereby a single image of increased brightness is reconstructed.

3,936,139

HOLOGRAPHIC MEMORY PROVIDING BOTH ANGULAR AND TRANSLATIONAL REFERENCE BEAM DEFLECTIONS

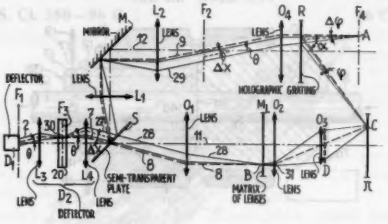
Jean Pierre Huignard, and Erich Spitz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sept. 7, 1973, Ser. No. 395,080

Claims priority, application France, Sept. 12, 1972, 72.32257

Int. Cl.² G03H 1/26

U.S. Cl. 350—3.5 4 Claims



1. A holographic data storage system for storing onto a predetermined area of a storage medium, and for retrieving from said area at least one group of data carried by a modulating object, said system comprising: a source of coherent radiation delivering a parallel beam; deflector means arranged for deflecting said parallel beam at an angle θ; beam translation means, arranged for receiving said deflected beam from said deflector means and for selectively laterally translating the angularly deflected beam to one of a plurality of laterally displaced positions while preserving the direction of propagation of the translated beam along the θ direction beam splitting means arranged for splitting said translated beam into an object beam and at least one reference beam; first stigmatic transmission means having an optical axis, arranged for focusing said object beam onto an illumination plane and at a lateral distance from said optical axis proportional to said angle θ; stigmatic convergent means positioned for projecting onto said storage medium an image of said illumination plane; second stigmatic transmission means having a further optical axis, arranged for focusing said reference beam onto a further illumination plane with an angle of incidence which is dependent upon said laterally displaced position, and at a further lateral distance from said further object axis proportional to said angle θ, and holographic means arranged for projecting within said predetermined area the reference beam emerging from said second stigmatic transmission means; said modulating object being disposed in the beam transmitted by said stigmatic convergent means, and the modulated radiation emerging from said modulating object falling onto said predetermined area for forming with said projected reference beam a recordable fringe pattern representative of said group of data.

3,936,140

ARRANGEMENT FOR SEQUENTIAL DATA STORAGE

Hartwig Ruell, Otterfing, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 31, 1974, Ser. No. 493,265

Claims priority, application Germany, Aug. 14, 1973, 2341140

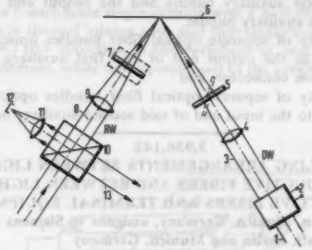
Int. Cl.² G03H 1/26

U.S. Cl. 350—3.5 3 Claims

1. In an apparatus for sequential data storage having a coherent light source from which a source symmetrical object wave and reference wave each are directed through one of two spherical lenses and through one of two corresponding plane-parallel, transparent plates onto a storage medium moving along a path, the improvement comprising:

a beam divider in the path of the reference wave between said spherical lens and said source;

each plane-parallel plate being selectively positionable in a first position normal to its respective wave for non-holographic recording and readout of data and in a second position which is inclined in relation to the wave for holographic recording and read-out of data; and



each plane-parallel plate being swivelable between its said first and second positions about an axis normal to its respective wave and substantially through a center portion of said wave.

3,936,141

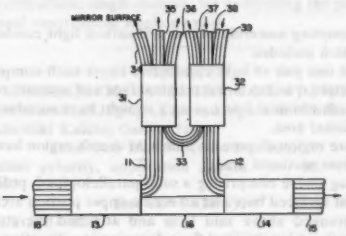
MULTIPLE OPTICAL CONNECTOR

A. Fenner Milton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,536

Int. Cl.² G02B 5/16

U.S. Cl. 350—96 C 1 Claim



1. In combination, an optical radiation coupler-connector, which comprises:

a main input optical multimode fiber optic bundle transmission bundle,

a main output optical multimode fiber optic bundle transmission bundle,

a main connector formed of an optical radiation transparent dielectric material optically connecting said main input bundle with said main output bundle,

said main connector including a first solid rod with an input end and an output end said input end optically connected to said main input bundle for conducting all of any input radiation to its output end, a second solid rod with an output and input end said output end optically connected with said main output bundle for conducting input radiation to all of said output bundle, a third solid rod having input and output ends, said input end receiving radiation from a portion of the output end of said first solid rod and conducting said received radiation to a portion of the input end of said second rod,

first and second auxiliary optical radiation connectors each having an input and an output end,

optical fiber bundle means optically connected to receive a portion of the output radiation from said first solid rod

and transmitting said radiation to said input end of said first auxiliary connector,

optical fiber bundle means optically connected between said input end of said second solid rod and said output end of said second auxiliary connector,

an optical fiber bundle connected between the input end of said first auxiliary bundle and the output end of said second auxiliary bundle,

a plurality of separate optical fiber bundles optically secured to the output end of said first auxiliary optical radiation connector, and

a plurality of separate optical fiber bundles optically secured to the input end of said second auxiliary bundle.

3,936,142

COUPLING ARRANGEMENTS BETWEEN LIGHT CONDUCTIVE FIBERS AND BETWEEN LIGHT CONDUCTIVE FIBERS AND TERMINAL EQUIPMENT

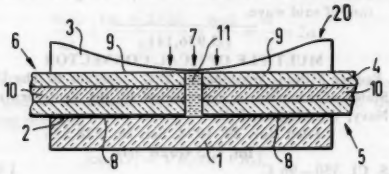
Ralf Kersten, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 7, 1974, Ser. No. 495,419

Claims priority, application Germany, Aug. 7, 1973, 2340019

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **23 Claims**



1. A coupling assembly between sheathed light conductive fibers which includes:

at least one pair of light conductive fibers each comprising an internal and external terminal face and a sheath region at each terminal free having a straight base annular cross sectional area,

a core region disposed within said sheath region having a cross sectional area;

a plug sleeve comprising a solid parallelopiped, polished, flat surfaced base and an elastic upper portion archedly arranged above said base and attached thereto and having a longitudinal flare decaying in a direction away from each end face of said plug sleeve, wherein said upper portion exerts an inward compressive force directed toward said base; and

a longitudinal opening centrally extending between the base and the upper portion of said plug sleeve to accommodate the incident light conductive fiber, wherein said opening is externally flared at a periphery of said upper portion and adapted at a center of the plug sleeve to facilitate its interfacing with the cross sectional areas of the light conductive fibers.

3,936,143

OPTICAL FIBRE END CONNECTOR

Setsuo Sato, Yokohama, Japan, assignor to Aoi Sansho Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1974, Ser. No. 497,107

Claims priority, application Japan, Apr. 15, 1974, 49-042564

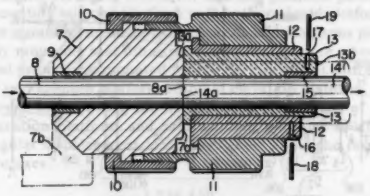
Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **4 Claims**

1. An optical fibre end connector comprising:

a. A first connector portion receiving a first optical fibre end to which another optical fibre end is to be connected, the first optical fibre end being in said portion so that its end surface lies in a plane of a surface wall of said first connector portion;

b. A second connector portion having an inner collar, means defining a hole extending longitudinally through said collar and being eccentrically displaced with respect to the longitudinal axis of said inner collar, an outer collar, means defining a hole extending longitudinally through said outer collar and being displaced eccentrically with respect to the longitudinal axis thereof, said inner collar being rotatably received within the hole in said outer collar, the distance between the center line of the hole in said outer collar and the center line of the hole in said inner collar being equal to the distance between the longitudinal axis of said outer collar and the longitudinal axis of said inner collar, means for rotating said inner and outer collars with respect to each other, the another fibre end being fixedly positioned within the hole in said inner collar and with the end surface of the another optical fibre end lying in a plane of a surface wall of said inner collar;



c. Support means rotatably receiving said outer collar and being adjustably positioned on said first connector portion, said support means being adjustable to move said surface wall of said inner collar into flush and abutting relationship with said surface wall of said first connector portion, whereby said inner and outer collars can be rotated with respect to each other to align another optical fibre end with the first optical fibre end.

3,936,144

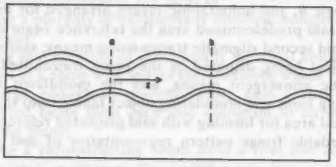
FREQUENCY SELECTIVE OPTICAL COUPLER

William M. Caton, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 12, 1974, Ser. No. 532,261

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **4 Claims**



1. A frequency selective optical coupler comprising:

first and second optical waveguides disposed with substantially uniform periodic variations in spatial separation relative to a common directional axis between respective input and output terminals, including repetitive sections of close proximity to permit optical coupling between said optical waveguides;

said first optical waveguide having a different optical length than said second optical waveguide between contiguous sections of close proximity included within said substantially uniform periodic variations in spatial separation,

whereby light energy of a determinable frequency propa-

gated along said first optical waveguide is substantially all coupled into said second optical waveguide over a determinable number of said repetitive sections between said input and output terminals, and light energy of all other frequencies is inhibited from being coupled into said second optical waveguide over said determinable number of said repetitive sections between said input and output terminals.

3,936,145

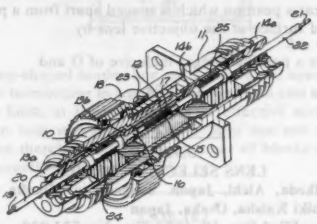
FIBER OPTIC ALIGNMENT SLEEVE

Ronald L. McCartney, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,627

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **16 Claims**



1. In a fiber optic connector for providing a removable light signal connection between the terminal ends of at least one pair of fiber optic cables, said pair including first and second cables each having a plurality of optical fibers and each including a termination pin of predetermined cross-sectional ends thereof, said connector further including first and second mating connector members adapted to contain at least said pair of cables and corresponding termination pins, the combination comprising:

retaining means within said first and second connector members, respectively, for retaining said termination pins and therefore said terminal ends of said corresponding first and second fiber optic cables in substantial axial light-transferring abutment when said first and second connector members are mated; and

means including an alignment sleeve of resilient material within said first and second connector members for effecting lateral alignment of said terminal ends of said termination pins and corresponding fiber optic cables, said sleeve including at least one axially extending slot through the wall of said sleeve over an axial dimension overlapping the point of said abutment, said sleeve being of an initial diameter over said axial dimension such that insertion of said termination pins produces resilient lateral expansion of said sleeve to produce inwardly directed radial forces tending to hold said terminal ends in lateral alignment.

3,936,146

IRREGULAR FERROELECTRIC ELEMENT FOR CONTROLLABLE SINGLE DOMAIN

Akio Kumada, Kodaira; Hiroshi Takano; Yoshizumi Eto, both of Hachioji, and Masao Hibi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 3, 1970, Ser. No. 16,199

Claims priority, application Japan, Mar. 15, 1969, 44-19912

Int. Cl.² G02F 1/05

U.S. Cl. 350—149 **19 Claims**

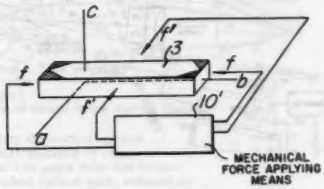
1. An irregular ferroelectric element having a controllable single-domain comprising:

1. a substrate of an irregular ferroelectric crystal, having an opposite pair of major surfaces parallel to the Z-plane, said substrate comprising

a. a first single-domain with a part of the periphery thereof extending in the <110> direction and having a first stationary polarity,

b. a second single-domain with a part of the periphery thereof extending in the <110> direction and having a second stationary polarity which is opposite to said first stationary polarity, and

c. a controllable single-domain with a part of the periphery thereof joining with said first single-domain in the <110> direction at the periphery of said first single domain, while the opposite part of the periphery of said



controllable single-domain joins with said second single-domain in the <110> direction at the periphery of said second single domain, and having a domain - wall which extends in the <110> direction and which is reversibly movable in the <110> direction from one of the joining peripheries to the other, and

2. polarization reversal means disposed on the opposite Z-plane surfaces of said substrate, and covering at least said controllable single-domain, for controlling the polarity of said controllable single domain.

3,936,147

VARIABLE CHARACTERISTIC LIGHT FILTER

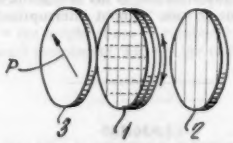
Sanjiro Murakami, Hyogo, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1973, Ser. No. 406,756

Claims priority, application Japan, Nov. 22, 1972, 47-134967

Int. Cl.² G02B 1/24

U.S. Cl. 350—158 **3 Claims**



1. A variable light filter system comprising a filter having a chromatic polarizing filter section including superimposed first and second chromatic polarizing filter components of different color transmission characteristics and whose polarizing axes are substantially perpendicular to each other and an achromatic polarizing filter section, said chromatic and achromatic polarizing filter sections being rotatable relative to each other, and a quarter wave retardation plate disposed in front of said filter and having its optical axis at an angle of substantially 45° to the vertical.

3,936,148

HEAD-UP DISPLAY UNITS AND OPTICAL DEVICES

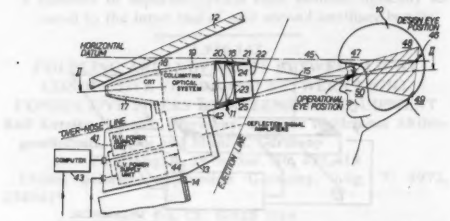
Stafford Malcolm Ellis, Ribblesdale, Ashford Road, Bearsted Maidstone, Kent, England

Filed May 31, 1974, Ser. No. 475,107

Claims priority, application United Kingdom, May 31, 1973, 25902/73; July 7, 1973, 32478/73; Nov. 3, 1973, 51134/73; Nov. 28, 1973, 55163/73

Int. Cl.[2] G02B 5/04, 27/10

U.S. Cl. 350—173 39 Claims



27. A head-up display unit which comprises a luminous data source, and between that source and an observer's observation position a beam-splitting periscopic device which is effective to deflect rays from that part of a scene ahead of the luminous data source which in the absence of the periscopic device would be obscured by the luminous data source, in such manner that the said part of the scene ahead is reconstituted at a position between the data source and the observation position, so that an observer at the observation position would have a substantially uninterrupted and undistorted angular field of view of the scene ahead superimposed upon the luminous data transmitted by the periscopic device.

32. An optical device

comprising two similar periscope-like elements each comprising means defining parallel-disposed, spaced, planar, light reflective, 'light input' and 'light output' optical faces,

the two elements being arranged in reverse relationship relative to one another on either side of a central plane of symmetry, with the respective light input faces spaced transversely apart on either side of the said plane, and with the respective light output faces adjoining one another at a common linear edge which lies in the said plane, and

supporting means for the said optical face defining means, the supporting means being arranged so that each eye of an observer looking at the light output faces whereby to observe through the device a distant scene lying ahead of the device in the direction of the said plane can see, and scan from side to side without interruption, both light output faces.

3,936,149

NON-HOMOGENEOUS OBJECTIVE LENS HAVING AN APERTURE DIAPHRAGM

Toshihiro Imai, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,464

Claims priority, application Japan, Oct. 4, 1973, 48-110960

Int. Cl.[2] G02B 3/00

U.S. Cl. 350—175 GN 5 Claims

1. A non-homogeneous objective lens comprising a small rod-shaped non-homogeneous light focussing and conducting body whose refractive index N(x) at a position radially spaced apart from an optical axis by a radius x is given by

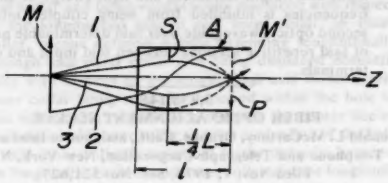
$$N(x) = No(1 - ax^2)$$

where No is a refractive index at the optical axis and a is a proportional constant, and a diaphragm for giving illumination which is sufficient to satisfy a rear relay lens system and arranged near a position which is spaced apart from a projected image end surface of the objective lens by

$$(¼ + n)L$$

where n is a positive integer inclusive of O and

$$L = \frac{2\pi}{\sqrt{2a}}$$



3,936,150

LENS SELECTION DEVICE

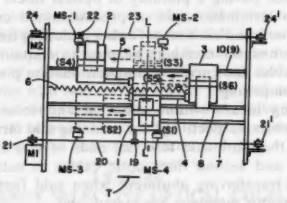
Hiroshi Ikeda, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 18, 1974, Ser. No. 533,920

Claims priority, application Japan, Dec. 22, 1973, 49-2168[U]

Int. Cl.[2] G02B 15/04; G03B 27/40

U.S. Cl. 350—183 10 Claims



1. A lens selection device including three magnification lenses each movably disposed in a direction perpendicular to a single reference axis and adapted to be shifted to a respective operative position on the reference axis, characterized in that:

two of the lenses are each adapted to be shifted by separate drive means while the third of the three lenses is provided with means to follow the movements of the aforesaid two lenses, said third lens being movable in response to particular movements of the aforesaid two lenses, whereby a desired one of the three lenses can assume an operative position on the reference axis.

3,936,151

CORRECTION LENSES UTILIZED TO FORM FLUORESCENT SCREENS OF COLOUR PICTURE TUBES

Eiichi Yamazaki, Ichihara; Toshio Ueda; Koichi Maruyama, both of Mobara, and Iwao Ogura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 4, 1973, Ser. No. 421,740

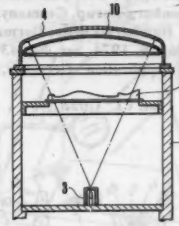
Claims priority, application Japan, Dec. 4, 1972, 47-120649

Int. Cl.[2] G02B 3/04; G03B 27/00

U.S. Cl. 350—189 7 Claims

1. A correction lens for photographically forming phosphor elements on the inner surface of a panel of a color picture tube to cause the light path to approximate the impingement point on said inner surface for electron beams emanated from electron guns disposed in the neck portion of the colour picture tube, said correction lens being comprised of a plurality of lens blocks formed at least on one side with an effective sur-

face thereon, said blocks each having a particular refractive characteristic determined in accordance with a portion of a fluorescent screen to be made up of said elements said correction lens having at least some step-shaped border lines formed in different configurations and sizes between said blocks, any



such step-shaped border line not being closed upon itself and without terminating in a point common to all said step-shaped border lines, at least some of said effective surfaces lying between said step-shaped border lines but not completely bounded thereby whereby the number of blocks comprising said correction lens is reduced.

3,936,152

BINOCULAR VIEWING DEVICE

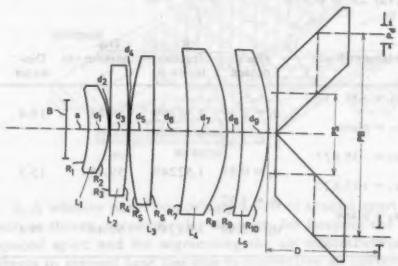
Friedrich Aurin, Heidenheim-Schnaitheim; Paul Kantor, Aalen; Helmut Knutti, Oberkochen, and Hans-Richard Weinheimer, Konigsbronn, all of Germany, assignors to Carl Zeiss Stiftung, Oberkochen, Germany

Filed Apr. 23, 1974, Ser. No. 463,380

Claims priority, application Germany, Apr. 28, 1973, 2321716

Int. Cl.² G02B *25/00, 21/20*

U.S. Cl. 350—202 **3 Claims**



1. A light weight hand-held device for magnified binocular viewing of fluorescent screens and the like, comprising only a single optical magnification system producing the entire desired magnification for binocular viewing, said optical magnification system including at least four individual lens elements with at least one aspherical surface, each of said individual lens elements being made of optical material having relatively low specific gravity and relatively high index of refraction, the magnification system being corrected, for an interpupillary distance (PS) of the optical system which corresponds approximately to the equivalent focal length (*f*) of the system, for spherical aberration, sine condition, and for a viewing angle of more than 12° for coma and astigmatism and distortion, said device having two rhombic prisms located behind the last surface of said single optical system, said prisms being so placed as to effect a pupillary division and to increase the interpupillary distance (PS) at said last surface to the interpupillary distance (PB) of an observer using the device, the lens elements and prisms being constructed and arranged with proportions substantially in accordance with the following structural data:

Lens	Radii mm.	Thicknesses and Spacings, mm.		Glass N	Glass V
	$R_1 = -40.4$				
L_1		$d_1 =$	6.8	1.80518	23.43
	$R_2 = -26.8$				
		$d_2 =$	0.1		
	$R_3 = +494.0$				
L_2		$d_3 =$	6.2	1.713	53.83
	$R_4 = -191.1$				
		$d_4 =$	0.1		
	$R_5 = +93.7$				
L_3		$d_5 =$	7.9	"	"
	$R_6 = -755.3$				
		$d_6 =$	10.7		
	$R_7 = -154.0$				
L_4		$d_7 =$	12.4	"	"
	$R_8 = -47.6$				
		$d_8 =$	4.8		
	$R_9 = -137.2$				
L_5		$d_9 =$	8.1	"	"
	$R_{10} = -52.3$				

Focal length	$= f =$ 32. mm
Distance from image being viewed to first vertex	$= a =$ 7.0 mm
Interpupillary distance of system	$= PS =$ 25. mm
Interpupillary distance of observer	$= PB =$ 58–72 mm
Distance of exit pupil from last vertex along stretched optical path, reduced to air	$= D =$ 40 mm
Diameter of pupil	$= P_d =$ 6.0 mm
Diameter of image to be observed	$= B =$ 18.0 mm

Aspherical surfaces data:

Surface R_3	Surface R_8	Surface R_{10}
$2.0350869.10^{-6}$	$1.5410828.10^{-7}$	$-5.6828165.10^{-10}$
$-1.3712518.10^{-8}$	$-7.7980634.10^{-10}$	$1.6465498.10^{-9}$
$2.2478209.10^{-11}$	$-8.2352009.10^{-13}$	$-9.6092972.10^{-13}$
$-1.1904954.10^{-14}$	$6.8468427.10^{-16}$	$9.2018506.10^{-16}$

wherein the individual lens elements numbered consecutively from front to rear are indicated by the respective subscript numerals used with the letter L, the radii of curvature of the surfaces of such lens elements are respectively indicated by the letter R with a numerical subscript corresponding to consecutive numbering of the surfaces from front to rear, the axial thicknesses of the respective lens elements and of the air space between the elements are respectively indicated by the letter d with a numerical subscript corresponding to consecutive numbering of such thicknesses in a single series applying to both the element thicknesses and the air space thicknesses, the index of refraction of the material of which each lens element is made is indicated in the column headed N, the index of dispersion of such material is indicated in the column headed V, both indices being with reference to the yellow helium line having a wavelength of 5875.6 Angstrom units, and the values respectively indicated by the letters C with numerical subscripts are the values of the coefficients used in defining the aspherical shape of the respectively indicated lens surfaces, according to the aspherical equation

$$p = h^2/2r + c_1h^4 + c_2h^6 + c_3h^8 + c_4h^{10}$$

wherein p = the height of arc or camber, h = the corresponding meridional coordinate, and r = the radius of the zenith or vertex.

3,936,153

RETROFOCUS TYPE OBJECTIVE LENS SYSTEM

Toshinobu Ogura, Tondabayashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1974, Ser. No. 450,249

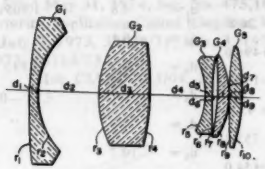
Claims priority, application Japan, Mar. 12, 1973, 48-27978

Int. Cl.² G02B *9/60*

U.S. Cl. 350—216 **3 Claims**

1. A retrofocus objective lens system comprising a negative meniscus front first lens having a concave rear face, a biconvex second lens, a biconcave third lens, a positive meniscus fourth lens with a convex rear face, and a positive fifth lens, said lens system satisfying the following conditions:

$1.6\ (d_5 + d_6 + d_7 + d_8 + d_9) > d_4 > d_5 + d_6 + d_7 + d_8 + d_9\ 0.7d_4 < d_5 < 1.3d_4$



$$-0.5 < \frac{r3}{r4} < -0.1$$

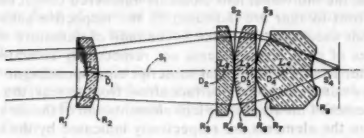
wherein r_j is the radius of curvature of the jth lens face successively designated from the front lens face, and d_j is the axial distance between the jth and the $j+1$ lens faces of the lens system.

3,936,154

SHORT FOCAL LENGTH LARGE APERTURE OPTICAL SYSTEM

Andor A. Fleischmann, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 11, 1974, Ser. No. 522,654
Int. Cl.² G02B *9/12, 9/34, 13/18*
U.S. Cl. 350—220 **2 Claims**



1. An optical system of relatively short focal length and large aperture having substantially the following specification:

EFL = 7.58mm
½ Angle of Field = 2.58°

LENS	RADII (IN.)	THICKNESS (IN.)	SPACING (IN.)
L_1	R_1 = +.3000	D_1 = .0500	
	R_2 = .4561		S_1 = .6391
L_2	*R_3 = −18.01123	D_2 = .0993	
	[R_3 = A(1)]		
	R_4 = .7530		S_2 = .0500
L_3	R_5 = .6069	D_3 = .1073	
	R_6 = 6.5060		S_3 = .0070
L_4	*R_7 = .23131	D_4 = .2923	
	[R_7 = A(2)]		
	[R_8 = −.6121]		
	R_9 = −.2161		S_4 = .1450 BFL

ALL ELEMENTS: V=57.4, N_D=1.4917

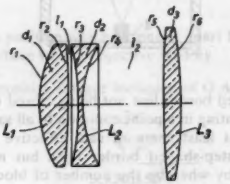
wherein the first column lists the lens elements numerically starting at the ray entrance side of the system which elements each have the same dispersive index and refractive index; the second column lists the respective base radii and the vertex radii of the aspheric surfaces *R_3 and *R_7; the negative (−) values of the radii indicate surfaces which are concave; the third column lists the thickness D_1 to D_4 of the respective elements; and the fourth column lists the axial spacings S_1 to S_4 between the respective elements, and the image plane.

3,936,155

THREE-ELEMENT PROJECTION LENSES

Kurt Kirchhoff, Hamburg-Lurup, Germany, assignor to Heinrich Reichmann, Hamburg-Lurup, Germany

Filed Jan. 9, 1974, Ser. No. 431,680
Claims priority, application Germany, Jan. 10, 1973, 2300985
Int. Cl.² G02B *9/04*
U.S. Cl. 350—226 **2 Claims**



1. A triplet-type three-element projection lens particularly suitable for overhead projectors projecting non-monochromatic light, comprising, in combination, a convergent front lens element, a divergent center lens element and a convergent rear lens element in aligned relationship defining a light path, said lens elements being formed of substantially the same optical glass having a refractive index of less than 1.535, said lens having the following design parameters, related to a focal length of $f' = 100$:

Image intercept length $s' = 92.69$
Image angle $2\theta = 43°$
Petzval $\Sigma P = 0.524$

Lens	element/Radii	Thicknesses	Refractive Index n_d	Dispersion v_d	Diameter
L_1	r_1 = +28.132	d_1 = 2.49	1.52249	59.48	19.4
	r_2 = plane	p_1 = 4.52			
L_2	r_3 = −35.827	d_2 = 0.87	1.52249	59.48	15.3
	r_4 = +35.827	p_2 = 4.52			
L_3	r_5 = plane	d_3 = 2.49	1.52249	59.48	19.4
	r_6 = −28.132				

3,936,156

JEWELRY DISPLAY AND VIEWING DEVICE

Jerry Shaw, 50 W. Fairlawn Blvd., and Samuel G. Solitt, 2121 Brookshire Road, both of Akron, Ohio 44313

Filed Aug. 14, 1974, Ser. No. 497,265
Int. Cl.² G02B *5/08, 27/02*
U.S. Cl. 350—235 **5 Claims**

1. A jewelry display and viewing device, comprising:

A. a plurality of interconnected upstanding frames;

B. a mirror mounted on the inner surface of each of said frames;

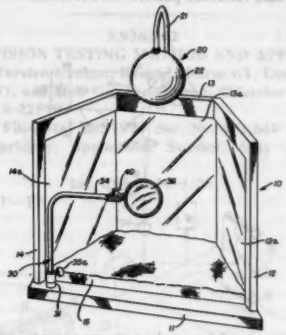
C. a base member having upper and lower planar faces;

D. a cushion member mounted on said upper planar face of said base member;

E. said frames being secured to the periphery of said base member and projecting upwardly therefrom;

F. an adjustable magnifying device disposed in overlying relationship with said base member; and

G. a light source



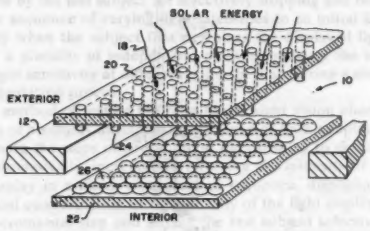
1. carried by one of said frames
2. in overlying relationship with said base member
3. and in substantially overlying relationship with said magnifying device.

3,936,157

HIGH EFFICIENCY LIGHT TRANSMITTING WINDOW PANEL

Narinder S. Kapany, Woodside, Calif., assignor to Kaptron, Inc., Palo Alto, Calif.

Filed Apr. 22, 1974, Ser. No. 462,856
Int. Cl.[2] G02B 17/00
U.S. Cl. 350—258 10 Claims



1. A window panel comprising a pair of spaced apart transparent sheets, perpendicular supports for keeping the sheets spaced apart and for segmenting the air space between the sheets to prevent heat loss due to convective air currents, the supports being made of light transmitting material arranged to transmit incident light striking the window within a predetermined angle of acceptance through the window panel by means of multiple total internal reflections.

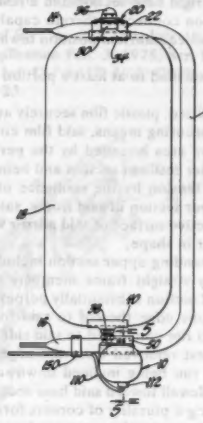
3,936,158

REMOTE CONTROL REAR VIEW MIRROR OPERATING MECHANISM

Joseph Cianciolo, and Robert E. McGargal, both of Grand Rapids, Mich., assignors to Rem Die Casting, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 418,473, Nov. 23, 1973, abandoned.
This application Dec. 30, 1974, Ser. No. 537,534
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—289 1 Claim

1. An electrical drive and switching arrangement for reversible electric motors operative of rear view mirrors for vehicles and providing for remote control actuation thereof, said arrangement including a housing structure for a small reversible electric motor, a threaded shaft driven by the motor and having a travel nut thereon, a mirror member and a mirror drive connection with follower operatively engaged with the travel nut, all of which provides an operating mechanism for a remote control rear view mirror, said housing structure comprising a complimentary housing member parts of relatively thin walled construction and like contour in cross-section for receiving said motor and shaft longitudinally therebetween and having them closely fitted therewithin, said housing member parts having their opposite and respective ends curved and contoured to also more closely encase the ends of said motor shaft and to provide structural strength in combination and to the exclusion of non-functional internal walls and ribs, a motor mounting wall member respective within and between said housing parts and having the reversible electric motor pre-assembled thereto and extended on one side thereof and with the threaded shaft driven by the motor extended therethrough and on the other side thereof, receptive means formed within said housing member parts and grooved to receive and retain said mounting wall member in precise location therebetween and in cross-sectional strengthening relation transversely across said housing member parts as received and entrapped therewithin, parallel spaced guide walls provided longitudinally within one of said housing member parts from said mounting wall receptive means towards



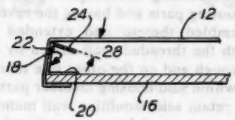
the end of said one housing part for retaining the threaded shaft and its travel nut therebetween and providing added structural strength to said housing part, bearing receptive means provided between the ends of said guide walls and bearing means receptive in said means and of the end of said threaded shaft for supporting said threaded shaft and its travel nut relatively spaced from the bottom wall of said one housing part, means received through the other of said housing member parts and including said mirror drive connection and said follower for travel nut engagement, and means sealing housing member parts together and retaining said operating mechanism in assembly as described therebetween, electrical means received and retained between said guide walls lengthwise under the threaded shaft for operative control of said motor and for contact engagement with said travel nut to effectuate reverse drive of said motor at end travel positions upon actuation of reversible switch means, said travel nut being relieved transversely thereacross an opposite sides thereof to afford relative bending freedom longitudinally for eliminating thread play and having a downwardly tappering slot receptive of the end of said follower or like shape therewithin, and said follower supporting the weight of said mirror member and mirror drive connection to provide the close fitting of said travel nut on said threaded shaft and the contact engagement required.

3,936,159

HEAT SHRUNK PLASTIC FILM MIRROR

Stanford Pavenick, South Orange, N.J., assignor to New Age Mirror & Tile Industries, Newark, N.J.

Filed Mar. 15, 1974, Ser. No. 451,652
Int. Cl.² G02B 5/08
U.S. Cl. 350—310 20 Claims



1. A plastic film mirror having a definable periphery and an interior comprising:

a frame having a rigid base section and a resilient upstanding upper section connected thereto capable of bending inwardly from an equilibrium position toward the interior of said mirror;

securing means attached to at least a portion of said frame; and,

a metalized, metalized, plastic film securely attached to said frame by said securing means, said film covering at least a portion of the area bounded by the periphery of said upstanding upper resilient section and being held in constant, uniform tension by the resilience of said resilient upstanding upper section of said frame, said film forming a primary reflective surface of said mirror which is generally rectangular in shape,

said resilient upstanding upper section including a plurality of substantially straight frame members each having a foot, a sidewall section substantially perpendicular to and connected at one edge thereof to said foot; and an inwardly directed rim connected to said sidewall section at the edge farthest removed from the edge connected to said foot, said rim being inclined downwardly from the edge of said sidewall toward said base section, said frame further including a plurality of corners formed where the ends of said frame members are in closest proximity to each other, said corners being formed in such a manner that there is a sufficient gap between the sidewalls of adjacent frame members so that said sidewall section and said rim of said frame members can bend inwardly under the tension of said film without hindering each other.

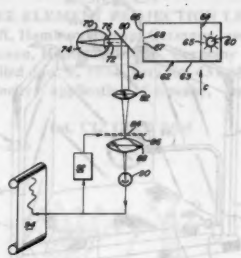
3,936,160

INTERFEROMETER FOR THE MEASUREMENT OF WAVEFRONT SECTIONS OF GENERAL IMAGING SYSTEMS INCLUDING THE HUMAN EYE

Karlheinz Von Bieren, Tudor Hill Laboratory, F.P.O., N.Y. 09560

Filed Oct. 15, 1973, Ser. No. 406,596
Int. Cl.² A61B 3/10
U.S. Cl. 351—6 10 Claims

1. An interferometer for measuring aberrations in a lens system comprising movable means for generating a Fourier transform pattern in an eye, means for reflecting said pattern in said eye onto a mask, said mask defining slotted aperature means therein to allow a portion of said reflected pattern to pass therethrough onto a recording means, an imaging lens positioned in the path of said reflected pattern between said reflecting means and said mask and a relay lens positioned in the path of said reflected pattern between said



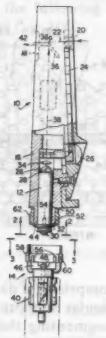
recording means, said recording means comprising high speed film which records the aberrations of the eye.

3,936,161

OPHTHALMOSCOPE ILLUMINATION ARRANGEMENT

Helmut A. Heine, Herrsching, Upper Bavaria, Germany, assignor to Propper Manufacturing Company, Inc., Long Island City, N.Y. and Optotechnik Heine KG, Herrsching, Upper Bavaria, Germany

Filed Aug. 14, 1974, Ser. No. 497,187
Int. Cl.² A61B 3/12
U.S. Cl. 351—6 3 Claims



1. An ophthalmoscope comprising an ophthalmoscope chassis defining a bulb-receiving sleeve therein, a bulb carrier shaped to be received within said sleeve, said carrier including stop means with the distance between the filament of said bulb and said stop means being predetermined to establish the longitudinal position of said filament in said chassis, rotational guide means associated with said sleeve and corresponding rotational guide means associated with said carrier, alignment of said guide means establishing the rotational position of said carrier with said sleeve, said guide means being fixed with respect to said filament so that alignment of said guide means establishes the rotational position of said filament within said chassis to provide most effective illumination, and closure means positioned over said sleeve for securing said carrier within said sleeve, said closure means including rotational guide means engaging the rotational guide means of said sleeve and said carrier, said closure means rotating over said sleeve on attachment thereof to sequentially engage the guide means of said carrier and the guide means of said sleeve to

automatically rotate said carrier into proper position as said closure means is attached.

3,936,162

NIGHT VISION TESTING METHOD AND APPARATUS

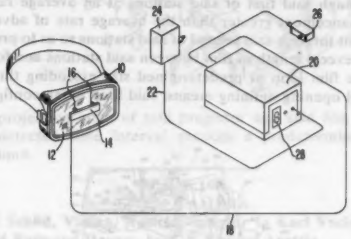
Carl Erik Torsten Krakau, Bengt Lidforss v.1, Lund, Sweden (S-22365), and Rolf Gunnar Ohman, Odarslov 88, Lund, Sweden (S-22590)

Filed May 20, 1974, Ser. No. 471,669

Claims priority, application Sweden, May 23, 1973, 7307223

Int. Cl.² A61B 3/06

U.S. Cl. 351—17 10 Claims



1. Night vision testing apparatus for determining a time based dark adaptation characteristic of a subject comprising means for presenting a light display to the subject at variable intensities, means for automatically and incrementally varying the intensity of the light display in a fixed, time ordered sequence, means for displaying a numerical quantification of the intensity of the light display at each increment and means operable by the test subject for selectively stopping and resetting the sequence of varying light intensities to an initial light intensity when the subject first perceives the displayed light, to give a plurality of independent measurements of the subject's light sensitivity at different points in time during a single dark adaptation process.

9. A method of testing the time based night vision characteristics of a subject during a single course of dark adaptation comprising the steps of presenting a light display to the subject, automatically, incrementally varying the intensity of the light display in a fixed, time ordered sequence, displaying a numerical quantification of the intensity of the light display at each incremental step and having the test subject selectively stop, reset and recycle the sequence of varying light intensities from an initial light intensity when he first perceives the light display.

3,936,163

VISION EXAMINATION LENS SYSTEM

John E. Toth, San Diego, Calif., assignor to Gilber B. Razran, San Diego, Calif.

Filed Sept. 10, 1973, Ser. No. 395,658

Int. Cl.² A61B 3/02

U.S. Cl. 351—17 6 Claims

1. An optical system for use in testing human vision as an aid in the prescription of corrective lenses and other vision examination, wherein the improvement comprises:

a frame,

lens means mounted on said frame for producing a spherical power of a nominal fixed focal length and a variable cylindrical power,

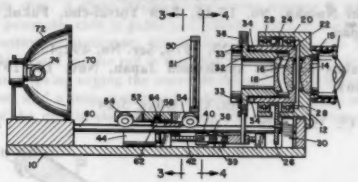
said lens means comprising a first spherical lens fixedly mounted on said frame defining an optical axis, and first and second cylindrical lenses having substantial cylindrical power of substantially equal and opposite magnitude,

said first and second cylindrical lenses being mounted on said frame for translation relative to one another along said optical axis and being rotatable about said optical axis,

the cylindrical axes of said first and second cylindrical lenses being maintained parallel,

a target,

said target and said lens means being mounted on said frame



for relative movement along said optical axis between points substantially less and substantially more than the nominal focal length of said lens means,

and an eye piece mounted on said frame in position for viewing said target through said lens means.

3,936,164

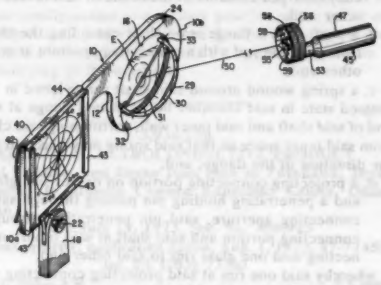
INSTRUMENTS FOR MEASURING VISUAL FIELDS

Samuel W. Cohen, Brooklyn, and Anton Banko, Bronx, both of N.Y., assignors to Surgical Design Corporation, Long Island City, N.Y.

Continuation of Ser. No. 273,150, July 19, 1972, abandoned. This application Feb. 3, 1975, Ser. No. 546,404

Int. Cl.² A61B 3/02; G02B 5/16

U.S. Cl. 351—23 27 Claims



1. A perimeter instrument for making measurements of the visual field of an eye of a human comprising in combination a frame, said frame formed with an opening therein to accommodate viewing therethrough by the eye whose visual field is to be measured, protractor means, means attached to said frame for holding said protractor means in said opening, said protractor means including a base line portion extending across said opening and a measuring portion for indicating an angular relationship with respect to a point on said base line, a movable object to be viewed by the eye when in said opening, and elongated means connected between said object and said instrument, said elongated means intersecting said point on said base line portion and having a portion thereof lying adjacent said measuring portion of said protractor means, said portion of said elongated means adjacent said measuring portion of said protractor means indicating the angle of said object with respect to the base line portion.

An instrument for use in the measurement of the visual field of an eye of a human comprising a frame in the general shape of a pair of eyeglasses, said frame formed with an opening at a position normally occupied by one of the eyeglass lenses, protractor means in said opening for measuring the visual field of an eye looking through said opening, a record medium having indicia thereon corresponding to the visual field and means for mounting said record medium at

the position normally occupied by the other of the eyeglass lenses.

3,936,165

EYEGLASSES

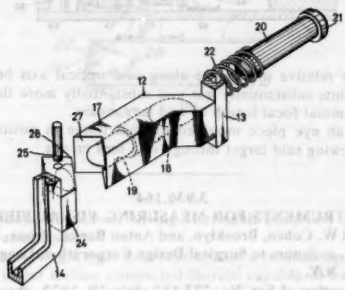
Ihachi Nosaka, No. 17-16, Kita Yotsui-cho, Fukui, Fukui, Japan

Filed July 29, 1974, Ser. No. 492,453

Claims priority, application Japan, Nov. 15, 1973, 48-128661

Int. Cl.² G02C 5/04

U.S. Cl. 351—128 1 Claim



1. In a pair of eyeglasses, a pair of glass rims, and between the glass rims, in combination:

a. a cylindrical nose bridge having a longitudinal recess at one end, said recess having an inner space and a diametrically enlarged chamber at the inside of said recess with an inner wall;

b. a shaft with a flange, said shaft extending therethrough from said one end with a connecting aperture at said shaft other end;

c. a spring wound around said shaft sandwiched in a compressed state in said chamber between said flange at the one end of said shaft and said inner wall, partitioning said chamber from said inner space so that said spring may bias said shaft in the direction of the flange; and,

d. a projecting connecting portion on one of said glass rims and a penetrating holding pin passing through said shaft connecting aperture, said pin penetrating through said connecting portion and said shaft at said other end, connecting said one glass rim to said other end,

whereby said one rim at said projecting connecting portion detachably engages said bridge under the pulling effect of said spring, said rim being able to turn around or turned back by pulling out said rim from said bridge, the other rim being coupled to the bridge said one end.

3,936,166

MULTIPURPOSE AUDIO-VISUAL CASSETTE METHOD

Donald T. Scholz, Watertown, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 374,578, June 28, 1973, Pat. No. 3,848,977. This application Aug. 5, 1974, Ser. No. 494,837

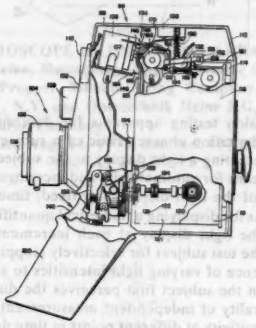
Int. Cl.² G03B 31/00

U.S. Cl. 352—38 3 Claims

1. A method of operating a compact film handling cassette in both photographic and audio operational modes, said cassette including a housing, a strip of photographic film material retained within said cassette housing, opening defining means in said cassette housing for providing a pair of spaced apart stations, one of said stations being configured for operation of a photographic program with said film strip and the other of said stations being configured for operation of an audio program with said film strip, means within said housing for guiding said film strip along a given path within said housing between said stations, said guiding means including means for storing an excess of film between said stations in a free loop extending exteriorly of said cassette housing through a portion of said opening defining means located between said stations, said method comprising the steps of:

advancing said film strip in a given direction so that any given portion of said film strip initially proceeds through a first of said stations and then through a second of said stations, said advancing step including advancing said film strip in said given direction intermittently through said one station so as to progressively present incremental sections of such film strip at said one station and simultaneously advancing said film strip in said given direction substantially continuously through said other station;

initially varying the relative rate of advancement of said film strip through said stations to advance said film strip through said first of said stations at an average rate of advancement greater than the average rate of advancement through said second of said stations so as to provide an excess length of film between said stations and form a free film loop of predetermined size extending through said opening defining means, said loop being configured



for isolating said intermittent and continuous advancements of said film strip;

then maintaining substantially equal average rates of advancement through said stations so as to maintain said predetermined size of said film loop;

performing a photographic program with said incremental sections presented at said one station by said intermittent advancement;

performing an audio program with portions of said film strip presented at said other station as said portions are advanced therethrough; and

finally varying the relative rate of advancement through said stations to advance said film strip through said first of said station at an average rate of advancement less than the average rate of advancement through said second of said stations so as to substantially eliminate said excess length of said film strip and draw said loop of film back into said cassette housing at the termination of said programs.

3,936,167

DEVICE FOR AUTOMATICALLY CONTROLLING A PROTECTIVE FILTER IN A FILM PROJECTOR

Shigeo Wakahara, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 20, 1974, Ser. No. 499,079

Claims priority, application Japan, Aug. 24, 1973, 48-94275

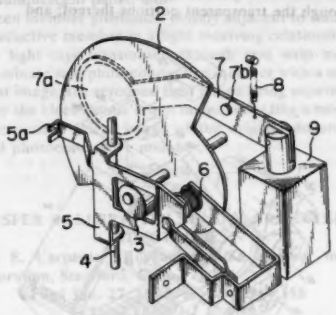
Int. Cl.² G03B 21/16

U.S. Cl. 352—148 6 Claims

1. A filter control device for a film projector of the type in which film is advanced in response to film advance signals, comprising:

means for detecting the time intervals between successive film advance signals; and

control means responsive to said detecting means for causing insertion of a filter into the light path between a



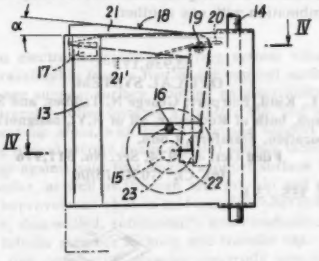
projection lamp of said projector and said film when a detected time interval exceeds a predetermined time limit.

3,936,168

FILM CAMERA

Josef Schild, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Nov. 12, 1973, Ser. No. 415,128
Claims priority, application Austria, Nov. 13, 1972, 9623/72
Int. Cl.² G03B *9/10*
U.S. Cl. 352—209 **4 Claims**



1. A camera having a film position, an objective lens, a shutter, guiding means defining a linear path of reciprocation for said shutter, a motor connected to drive said shutter back and forth along said path, a supplementary diaphragm mounted to reciprocate in unison with said shutter and movable with respect thereto from a first position in which the light incident at the film position is partially restricted by said diaphragm and a second position at which the light is not restricted by said diaphragm, and control means driven rotationally by the motor and creating an inertial force operatively effective to displace the diaphragm progressively from its first position to its second position during acceleration of the motor to its operating speed.

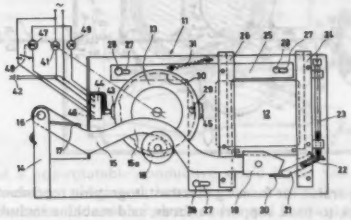
3,936,169

DEVICE FOR MOVING SLIDES VERTICALLY IN PROJECTORS

Karlheinz Barowski, Okriftel; Kurt Schubel, and Hans Weinhofer, both of Munich, all of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main and Enna-Werk Optische Anstalt, Munich, both of, Germany

Filed Sept. 6, 1974, Ser. No. 503,567
Claims priority, application Germany, Sept. 7, 1973, 2345333
Int. Cl.² G03B *23/04*
U.S. Cl. 353—115 **5 Claims**

1. A device for moving slides vertically in slide projectors so that slides may be lowered from a circular magazine into a projection postion and then raised from the projection position back into the magazine, the device being of the type including an arm pivotally mounted at one end, a spring connected to the arm, a shoe on the end of the arm for carrying a slide, a multi-cam disc, an electric motor connected to drive the cam disc, a slide guide arrangement having a pair of spaced prismatic rails to guide and hold the slide in the projection position, a stationary mount for one of the rails and a movable mount for the rail in the plane of a slide in-projection position, a spring urging the movable mount against the multicam disc, and a stop positioned to limit the downward movement of the end of the arm carrying the shoe with improve-



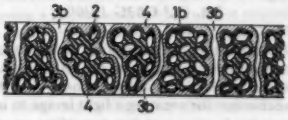
ment comprising: means connecting the spring connected to the arm to urge the end of the arm carrying the shoe downwardly, an upwardly curved center portion of the arm, a roller carried by the multi-cam disc and describing a circular path positioned under the upwardly curved center portion of the arm, the configuration and relative position of the roller and upwardly curved center portion of the arm allowing the shoe at the end of the arm to dwell in its uppermost position to allow indexing of the magazine.

3,936,170

ELASTIC ELECTROCONDUCTIVE PRODUCT

Hiroshi Shibano, and Iizaka Isao, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 19, 1973, Ser. No. 380,923
Claims priority, application Japan, Aug. 1, 1972, 47-77455
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 R **5 Claims**



1. An electroconductive elastic member having an electrical resistivity in the range of 10^{12} to 10^{8} ohm/cm comprising:

an elastic base made of an open-cellular spongy material;

and having impregnated therein a mixture including polyvinyl alcohol, an electroconductive fine powder, an insolubilizing agent for insolubilizing said polyvinyl alcohol, and a softener having many hydroxyl groups, said softener comprising up to 20 percent by weight of said mixture and being selected from the group consisting of glycerin, ethylene glycol, propylene glycol, butylene glycol, polyethylene glycol and polyhydric alcohols, and wherein said mixture is fixedly formed on said base by irradiation with light, heating or like insolubilizing treatment.

3,936,171

ELECTROSTATOGRAPHIC METHODS AND APPARATUS

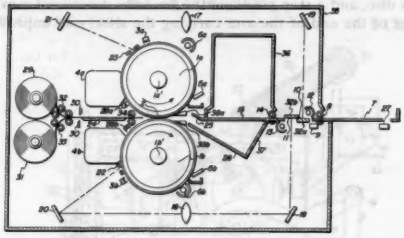
Edric Raymond Brooke, Welwyn Garden City, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 11, 1974, Ser. No. 450,268

Claims priority, application United Kingdom, June 25, 1973, 30009/73

Int. Cl.² G03B 27/00

U.S. Cl. 355—3 R 10 Claims



1. Apparatus for forming electrostatographic reproductions onto back-to-back support surfaces, said machine including a first movable photoconductive imaging surface, a second movable photoconductive imaging surface disposed opposite said first photoconductive imaging surface to form a transfer station therebetween, a first imaging station for forming an electrostatic latent image on said first photoconductive imaging surface, a second imaging station displaced relative to said first imaging station for forming an electrostatic latent image on said second photoconductive surface, said images being formed sequentially on said first and second imaging surfaces, the image on said second imaging surface being formed at a location thereon displaced relative to the image formation location on said first imaging surface corresponding to the displacement of said first and second imaging stations, means associated with each photoconductive surface for developing said first and second electrostatic latent images respectively, and means for moving said support surfaces into contact with the photoconductive surface at the transfer station to simultaneously transfer the developed images from the photoconductive surface onto said support surfaces respectively.

3,936,172

LIQUID CRYSTALLINE PLATEN FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

James H. McVeigh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1974, Ser. No. 456,089

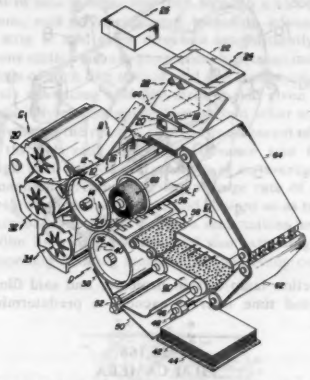
Int. Cl.² G03G 15/00

U.S. Cl. 355—3 R 7 Claims

1. An electrophotographic printing machine of the type having a corona generating device for charging a photoconductive member to a substantially uniform potential, and an exposure mechanism for creating a light image to irradiate the charged photoconductive member recording an electrostatic latent image thereon, wherein the improvement comprises:

an original document;

a support member mounted in the printing machine and arranged to hold said original document thereon, said support member being in a light receiving relationship with the exposure mechanism, said support including a liquid crystalline imaging cell having a pair of opposed, spaced substantially transparent plates, a grid of transparent electrodes interposed between said pair of plates, and a layer of crystalline material interposed between said pair of plates contacting said grid, said support member further including a substantially rigid frame member having an aperture therein, and resilient means secured to the frame member on the periphery of the aperture therein with the liquid crystalline imaging cell being mounted on the resilient means in the aperture of the frame member permitting light rays to be transmitted through the transparent portions thereof; and



means for electrically exciting said liquid crystalline imaging cell forming opaque portions to mask selected portions of the original document and creating indicia thereon so that said exposure means projects a light image of a masked original document or indicia singly or in combination with one another.

3,936,173

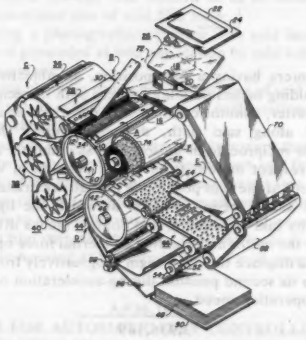
OPTICAL SYSTEM

Wayne L. Kidd, Fairport; George N. Tsilibes, and Stephen C. Urciuoli, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1974, Ser. No. 511,976

Int. Cl.² G03G 15/00

U.S. Cl. 355—3 R 5 Claims



1. An electrophotographic printing machine, including:

a photoconductive member;

means for charging said photoconductive member to a substantially uniform level;

exposure means for forming and projecting a light image of an original document onto the charged portion of said photoconductive member recording thereon an electrostatic latent image;

an electroluminescent panel extending substantially across the width of said photoconductive member;

strip means having lens portions thereon transmitting substantially parallel light rays therethrough from said electroluminescent panel; and

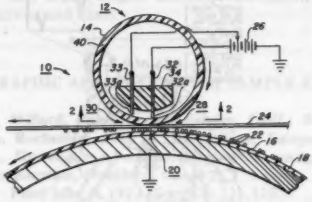
a screen member positioned closely adjacent to said photoconductive member in a light receiving relationship with the light rays transmitted through said strip means to illuminate said photoconductive member with a screened light image, the screened light image being superimposed over the electrostatic latent image recording a modulated electrostatic latent image of the original document on said photoconductive member.

3,936,174

TRANSFER ROLLER WITH STATIONARY INTERNAL ELECTRODE

Charles E. Carpenter, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 27, 1975, Ser. No. 544,156
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **7 Claims**



1. In an electrostatographic copying system wherein an image is transferable from a first image support surface to a second image support surface utilizing an electrically biased rotatable transfer roller forming a transfer nip, and adjacent pre and post-nip areas, with said first image support surface for passage of said second image support surface through said transfer nip against said first image support surface for said image transfer, as well as through said pre-nip and post-nip areas, the improvement wherein said transfer roller comprises:

an outer, thin-walled, substantially non-conductive, rotatable, tubular member forming said transfer nip,

at least one conductive transfer electrode non-rotatably mounted inside said tubular member,

said transfer electrode being electrically biased and providing transfer fields between said transfer electrode and said first image support surface through said tubular member,

said transfer electrode having a thin elongated blade-like edge extending in length axially along inside said tubular member, said blade-like edge extending towards said wall of said tubular member and towards said first image support surface to provide concentrated transfer fields between said blade-like edge and said first image support surface.

3,936,175

INTERNALLY SHIELDED TRANSFER ROLLER

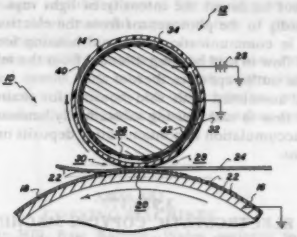
Robert N. Jones, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 29, 1975, Ser. No. 545,079
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 TR **14 Claims**

1. In an electrostatographic copying system wherein an image is transferrable from a first support surface to a second image support surface utilizing an electrically biased rotatable transfer roller forming a transfer nip, and adjacent pre and post-nip areas, with said first image support surface for passage of said second image support surface through said transfer nip against said first image support surface for said image transfer, as well as through said pre-nip and post-nip areas, the improvement wherein said transfer roller comprises;

an outer, thin-walled, substantially non-conductive, rotatable tubular member forming said transfer nip,

an electrically biased conductive transfer member inside said tubular member providing transfer fields between said conductive transfer member and said first image support surface through said tubular member,



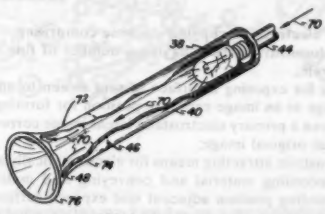
and a non-rotatable conductive shield inside said tubular member positioned between said conductive transfer member and said tubular member and between said conductive transfer member and said first image support surface, to block said transfer fields, said conductive shield being apertured at said transfer nip to pass said transfer fields therethrough.

3,936,176

DEVICE FOR MAINTAINING A DEVELOPABILITY REGULATING APPARATUS CONTAMINANT FREE

Charles A. Whited, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 19, 1973, Ser. No. 380,927
Int. Cl.² G03G *15/01*; F21V *29/00*
U.S. Cl. 355—4 **2 Claims**



1. A multicolor electrophotographic printing machine of the type having a photoconductive drum for recording successive single color electrostatic latent images which are rendered viewable by a development apparatus adapted to deposit toner particles complementary in color thereon, and a developability regulating apparatus comprising a light source arranged to illuminate an electrode mounted on the photoconductive drum and electrically biased to a voltage level sufficient to attract toner particles thereto during the development of the latent image and a photosensor for detecting the intensity of the light rays reflected from the electrode to indicate the density of the toner particles deposited thereon, wherein the improvement includes:

a first tubular shell arranged to support the light source therein, said first tubular shell having inlet and outlet apertures therein with the light source positioned in the region of the inlet aperture to produce light rays directed outwardly from the light source through the outlet aperture of said first tubular shell to the electrode;

first means, in communication with said first tubular shells, for creating a fluid flow in said first tubular shell, directed from the inlet aperture to the outlet aperture thereof;

a second tubular shell having one end portion thereof integral with said first tubular shell in the region of the outlet aperture and the other end portion thereof flared in an outwardly direction to maintain substantially laminar fluid flow in said first tubular shell to prevent the accumulation of contaminating deposits on the light source;

a housing arranged to support the photosensor therein, said housing having inlet and outlet apertures therein with the photosensor positioned in the region of the inlet aperture thereof to detect the intensity of light rays transmitted inwardly to the photosensor from the electrode;

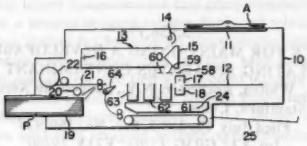
means in communication with said housing for creating a fluid flow in said housing directed from the inlet aperture to the outlet aperture thereof and

means, associated with said housing for maintaining the fluid flow in said housing substantially laminar to prevent the accumulation of contaminating deposits on the photosensor.

3,936,177
ELECTROSTATIC COPYING MACHINE

Inao Moriyama, Ebina; Yujiro Ando, Yokohama; Katsunobu Ohara, and Keiji Tanaka, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 11, 1974, Ser. No. 487,740
Claims priority, application Japan, July 17, 1973, 48-81335
Int. Cl.² G03G *15/01, 15/18;* **B65H** *29/30;* **G65H** *17/28*
U.S. Cl. 355—4 **22 Claims**



1. An electrostatic copying machine comprising:

a photosensitive screen having a number of fine openings therein;

means for exposing a surface of said screen to an original image at an image exposure position for forming on said screen a primary electrostatic latent image corresponding to an original image;

electrostatic attracting means for electrostatically attracting a recording material and conveying said material to a recording position adjacent said exposed surface of said photosensitive screen at said exposure position, after said formation of said primary electrostatic latent image;

means for supplying the recording material to said electrostatic attracting means; and

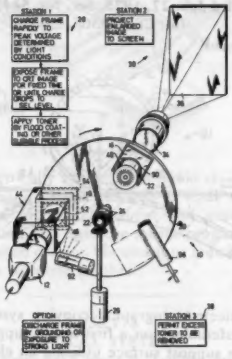
means for forming a secondary electrostatic latent image on said recording material at said recording position.

3,936,178
APPARATUS FOR LARGE SCALE SCREEN DISPLAY OF IMAGES

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Filed Nov. 30, 1973, Ser. No. 420,668
Int. Cl.² G03G *15/00*
U.S. Cl. 355—5 **37 Claims**

1. A system for effecting an enlarged image display on a viewing screen and utilizing a transparent electrophotographic film member of the type having a photoconductive coating, said system comprising: translatable carrier means mounting at least one electrophotographic film member, means operable on the carrier means stepwise to position said electrophotographic film member successively at each of plural stations located along the path of movement of said carrier means, said plurality of stations comprising: a recording station including means for projecting a scene upon the film member and stationary means for successively charging, exposing and toning the film member forming a projectable transparency of said scene at said recording station, the film member and said stationary means being immobilized one relative to the other throughout the operation of the charging, exposing and toning means, a projection station for applying an enlarged image of said scene from said transparency upon a viewing screen and an erase station having means for removing all toner from said film member, a lighttight housing accommodating said means for charging, exposing and toning, said housing including a


STATION 1
CHARGE FRAME RAPIDLY TO PEAK VOLTAGE DETERMINED BY LIGHT CONDITIONS
EXPOSE FRAME TO OPT IMAGE FOR FIXED TIME OR UNTIL CHARGE DROPS TO SEL. LEVEL
APPLY TONER OR FLUID COATING OF OPPOSITE POLARITY
STATION 2
PROJECT ENLARGED IMAGE TO SCREEN
OPTION
DISCHARGE FRAME BY GROUNDING OR EXPOSURE TO STRONG LIGHT
STATION 3
PERMIT EXCESS TONER TO BE REMOVED

wall having window means formed therein for transmitting the projected light pattern representative of said scene to the film member when the same is aligned therewith, and said means for charging, exposing and toning includes a charging device proximate said window means for charging the coating of said film member sufficiently to raise the surface potential thereof to a selected potential value, means intermediate said optical train and said charging device for exposing said film member to said pattern only when said potential value is reached, means proximate to said window for applying toner to the film member subsequent to exposure, and means for controlling the applied charge on the film in relation to the incident light intensity.

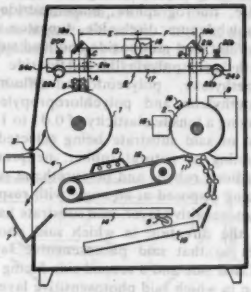
3,936,179
SUPPORT STRUCTURE FOR A DUPLICATOR OPTICAL SYSTEM

Shinichi Murakami, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed Dec. 11, 1974, Ser. No. 531,590
Claims priority, application Japan, Dec. 24, 1973, 48-146925
Int. Cl.² G03G *15/00*
U.S. Cl. 355—11 **7 Claims**

1. In a duplicator machine having a document drum and a photoconductor drum, an optical system comprising a table on which are fixedly mounted two spaced apart mirrors, said mirrors arranged to jointly reflect light from said document drum approximately 180° to said photoconductor drum, a pair of eccentric cams supported with their longitudinal axes substantially parallel to the plane of said table, means for supporting said cams for rotation about their longitudinal axes, adjust-

ing screws carried for rotation in said table and having ends bearing on said cams, whereby said table may be adjusted



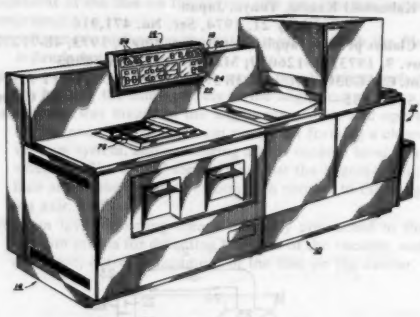
relative to said drums by the combined movement of said adjusting screws and cams.

3,936,180

XEROGRAPHIC APPARATUS WITH SAMPLE PRINT CAPABILITIES

Charles F. Willard, Palos Verdes Estates, Calif.; Brian D. Marsden, Rochester; John G. Richardson, Fairport, and James L. Gastonguay, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 4, 1973, Ser. No. 321,115
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **1 Claim**



1. A printing system including:

xerographic apparatus adapted to create images in response to variable data signals supplied thereto and to transfer such images to sheet material fed through the xerographic apparatus,

primary sheet receiving means adapted to receive the sheet material processed by said xerographic apparatus,

secondary sheet receiving means remote from said primary sheet receiving means and adapted to receive sheet material processed by said xerographic apparatus,

sheet supply means adapted to support sheet material to be forwarded through said xerographic apparatus so that graphic information may be transferred to the sheet material in relation to said data signals,

primary conveying means to direct sheet material from said sheet support means, through said xerographic apparatus, to said primary sheet receiving means,

secondary conveying means between said primary sheet receiving station and said xerographic apparatus to direct sheet material to said secondary sheet receiving means from said primary conveying means,

first operator controlled means which, when energized, applies power to the system and permits its operation,

second operator controlled means which, when energized, continues the operation of the system for the creation of images after the correction of a malfunction of the system,

third operator controlled means for creating a sample print on forwarded sheet material and duplicating said sample print,

fourth operator controlled means for creating an image on forwarded sheet material representative of preselected system status indications, and

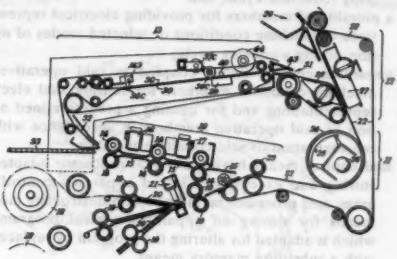
circuit means coupling the four above-mentioned operator controlled means with said secondary conveying means so that activation of any of said operator controlled means causes the activation of said secondary conveying means.

3,936,181

COPYING MACHINES

Frank Arthur Hill, New Radnor, Wales, assignor to Ozalid Group Holdings Limited, Loughton, England

Filed Oct. 10, 1973, Ser. No. 405,081
Claims priority, application United Kingdom, Sept. 26, 1972, 44337/72
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **3 Claims**



1. In a photocopying machine having a sheet feeding mechanism for circulating an original through the machine to enable a plurality of copies to be made in succession upon individual copy sheets from said original, wherein the improvement comprises:

a. a plurality of microswitches aligned in a row extending transversely to the direction of feed of the original by said sheet feeding mechanism and arranged for contact with the leading edge of the original;

b. a plurality of correspondingly aligned normally inoperative solenoid operated brakes respectively disposed behind the individual microswitches in the direction of travel of the original; and

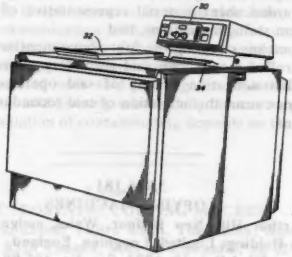
c. an electrical control circuit operative in response to contact of the leading edge of the original with any one microswitch prior to contact of said leading edge with any other microswitch to cause the solenoid of the brake disposed behind the contacted microswitch to apply said brake to the original, and in response to subsequent contact of said leading edge with another microswitch, to cause said solenoid to disengage said brake from the original, thereby aligning the leading edge of said original with said microswitches.

3,936,182

CONTROL ARRANGEMENT FOR AN ELECTROSTATOGRAPHIC REPRODUCTION APPARATUS

Sikander Sheikh, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 12, 1974, Ser. No. 496,666
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 10 Claims



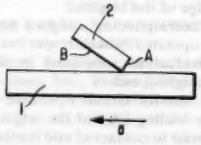
1. An electrostatographic copying apparatus comprising:
means for forming a latent electrostatic image, for developing the image and for transferring the image to a record medium;
said means including a plurality of operating members adapted for actuation at predetermined times during a copy reduction cycle; and
a plurality of members for providing electrical representations of machine conditions or selected modes of operation during a copying cycle;
apparatus control means coupled to said operative and machine condition members for sensing said electrical representations and for causing a predetermined actuation of said operative members in accordance with the representation of said condition member;
said control means having a digital processor adapted for storing and executing a stored apparatus control program, said processor including a non-destructive memory means for storing an apparatus control program and which is adapted for altering the program by replacement with a substitute memory means.

3,936,183

ELECTROPHOTOGRAPHIC COPYING MACHINE WITH IMPROVED CLEANING BLADE

Shigeru Sadamatsu, Tokyo, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1974, Ser. No. 447,524
Claims priority, application Japan, Mar. 9, 1973, 48-27165
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 4 Claims



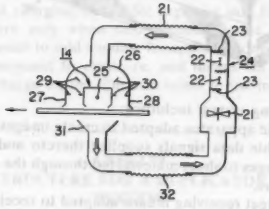
1. An electrophotographic copying machine comprising
a movable photosensitive layer upon which latent images are repeatedly toner developed and transferred to a receiving member, the material of said photosensitive layer being selected from the group consisting of selenium, selenium/arsenic alloy, and selenium/tellurium alloy; and cleaning blade in contact with said layer for cleaning therefrom toner not transferred to said receiving member, said blade including a cleaning layer containing materials selected from the group consisting of molybdenum disulfide, graphite, fluorographite, boron nitride, tungsten disulfide, molybdenum diselenide, tungsten diselenide, cadmium sulfide, lead monooxide and lead sulfide, polytetrafluoroethylene, polyvinylidene fluoride and polychlorofluoroethylene, polyreinforced-trifluoroethylene, polytrifluoroethylene and polychloropropylene and a substrate having a tensile elasticity of 0.01 to 10 Kg/mm², the material of said substrate being selected from the group consisting of natural rubber, neoprene rubber, sytrene-butadiene rubber and polyurethane rubber, said substrate being disposed at an angle with respect to said movable photosensitive layer, said substrate having a first side facing the direction in which said photosensitive layer moves so that said photosensitive layer moves toward said first side and a second side facing away from the direction in which said photosensitive layer moves so that said photosensitive layer moves away from said second side, said photosensitive layer being contacted substantially only by a corner of said cleaning blade comprising the intersection of said first and second sides thereof, only said first side of said substrate being covered with said cleaning layer which has a friction coefficient less than 0.8 with respect to the surface of said photosensitive layer.

3,936,184

ELECTROPHOTOGRAPHIC COPYING MACHINE

Keiji Tanaka, Kawasaki; Yujiro Ando, Yokohama, and Katsunobu Ohara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1974, Ser. No. 471,916
Claims priority, application Japan, July 9, 1973, 48-77272; Nov. 9, 1973, 48-126039; May 25, 1973, 48-58903
Int. Cl.² G03G *21/00*; G03B *27/52*; H05F *3/00*; H01T *19/04*
U.S. Cl. 355—15 10 Claims



1. An electrophotographic apparatus wherein an electrostatic latent image is formed with the utilization of at least means for applying voltage by corona discharge and illuminating means, comprising:
a photosensitive member;
means for charging said photosensitive member;
wall means for supplying a gas adjacent and between said charging means and said photosensitive member, said wall means being disposed along and adjacent said charging means; and
dust removing means connected to said wall means.

3,936,185

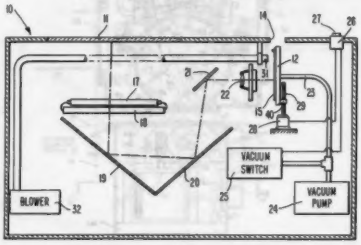
APPARATUS AND METHOD FOR HOLDING A FILM ON A CARRIER AND DETECTING CORRECT PLACEMENT

Frank C. Gross, Wilbraham, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 349,452, April 9, 1973. This application Apr. 8, 1974, Ser. No. 459,196

Int. Cl.[2] G03B 27/60

U.S. Cl. 355—73 9 Claims



1. In a photographic reproduction apparatus for directing a light image along an imaging axis to a photosensitive film positioned on a film carrier within the apparatus, combination means for holding the film on the carrier and detecting correct placement of the film on the carrier, the combination means comprising:

an alignment surface on the carrier against which the film is firmly held when imaged;

vacuum means operably connected to the alignment surface for holding the film securely to the alignment surface;

air-passageway means in the alignment surface and operably connected to the vacuum means for forming a closed vacuum system, and permitting a high vacuum level, only when the film is held securely against the alignment surface and in the correct position with respect to the imaging axis; and

vacuum level detecting means operably connected to the vacuum means for detecting the level of the vacuum, and therefore, correct placement of the film on the carrier.

3,936,186

APPARATUS FOR EXPOSING DIAZO PRINTING PLATES AND THE LIKE

Steven H. Boland, Arcadia, and Stephen Olah, Sierra Madre, both of Calif., assignors to Ultra-Violet Products, Inc., San Gabriel, Calif.

Filed July 25, 1974, Ser. No. 491,688

Int. Cl.[2] G03B 27/78

U.S. Cl. 355—83 13 Claims

13. Apparatus for exposing diazo printing plates and the like, including in combination:

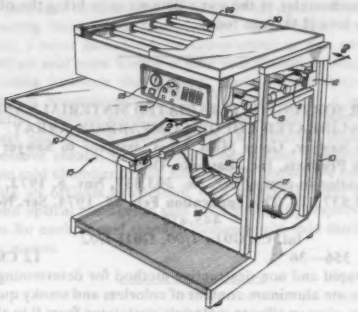
a frame;

a plurality of tubular lamps mounted in said frame in spaced parallel relation, said lamps having a narrow band spectral output at the 365 nanometer wave length region for imagewise exposing a radiation sensitive sheet;

a bed mounted in said frame for supporting sensitive sheet parallel to the plane of said lamp;

a plurality of radiation sensors, with a sensor mounted adjacent each lamp; and

a plurality of control circuits, with a circuit for each lamp, each of said control circuits including means for energizing the associated lamp in response to a start signal and deenergizing the lamp when the lamp has provided a



predetermined quantity of radiation as measured by the corresponding sensor.

3,936,187

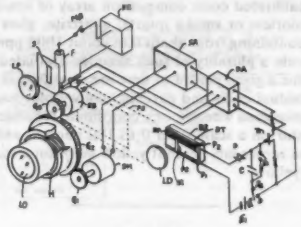
DISTANCE MEASURING DEVICE

Haruhiko Momose, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Hino, Japan

Continuation-in-part of Ser. No. 273,220, July 19, 1972, abandoned. This application Feb. 19, 1974, Ser. No. 443,359

Int. Cl.[2] G01C 3/00; G03B 7/08

U.S. Cl. 356—1 7 Claims



1. An automatic focusing device comprising in combination:

a. flashing means (F), a slit (S) and a projection lens (LP) disposed to direct flashing light on an object;

b. detector means (DT) and a detecting lens (LD) disposed to receive flashed light reflected from said object; said detector (DT) acting as a light slide rheostat and including two electrodes (P_1, P_2), a resistor (RP) and a photoconductive material (PC) interposed between one of said electrodes and said resistor, the other electrode being at one end of said resistor so that the electrical output between said two electrodes (P_1, P_2) varies with the position where a light beam strikes said photo conductive material (PC);

c. a servo-circuit responsive to said detector means (DT) including a differential amplifier (Tr_2, Tr_3) with a field effect transister (Tr_1) coupled to said differential amplifier and said detector means, a potentiometer (RB) and a servo-amplifier (SA) coupled to said differential amplifier; and,

d. a condenser (C) connected to said detector means (DT) and, a two pole switch (S_2) to connect said detector means first, to said servo-circuit, whereby light is first flashed from said flashing means onto an object and reflected onto said detector means to charge said condenser (C) and then switched over to said servo-circuit

where, if the charge on said condenser is different from the output from said field effect transistor, the servomotor will rotate to make up this difference moving the potentiometer at the same time so as to bring the objective lens (LO) into focus.

3,936,188

COLOR SORTING OF IRRADIATED MATERIALS AND A CALIBRATED COLOR COMPARISON ARRAY

Baldwin Sawyer, Gates Mills, Ohio, assignor to Sawyer Research Products, Inc., Eastlake, Ohio

Continuation-in-part of Ser. No. 303,857, Nov. 6, 1972, Pat. No. 3,837,826. This application Feb. 25, 1974, Ser. No. 445,475

Int. Cl. G01n *1/00*; G01j *1/02*

U.S. Cl. 356—36 12 Claims

1. A rapid and non-destructive method for determining the approximate aluminum content of colorless and smoky quartz, quartzite, glass or silicate materials containing from 0 to about 1000 ppm of alluminum which comprises the steps of:

a. irradiating particles of said material with ionizing radiation of a measured period of time and at a known intensity sufficient to cause the distinctive colorations that occur in such material containing aluminum,

b. measuring the amount of overall residual color in each particle of irradiated material,

c. measuring the proportion of yellow color in each particle of irradiated material, and

d. comparing the amount of color and the proportion of yellow determined in each particle in steps (b) and (c) to color standards of measured aluminum content irradiated at the same dosage, whereby the aluminum content of the particle is determined from its measured color properties.

11. A calibrated color comparison array of irradiated samples of colorless or smoky quartz, quartzite, glass or silicate material containing from about 0 to about 1000 ppm of aluminum wherein a plurality of such samples irradiated at a given intensity for a given period of time are classified as to percent overall residual color and percent yellow color and arranged in two dimensions wherein one coordinate represents percent overall color on a scale from 0 to 100 percent and the other coordinate represents percent yellow color on a scale of from 0 to 100 yellow.

3,936,189

ON-LINE SYSTEM FOR MONITORING THE COLOR, OPACITY AND BRIGHTNESS OF A MOVING WEB

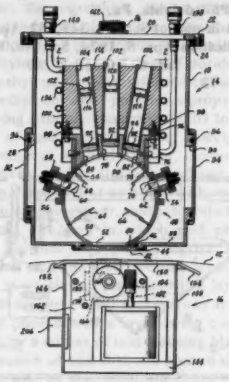
Joseph De Remigis, New Market, Canada, assignor to Sentrol Systems Ltd., Downsview, Canada

Filed Mar. 13, 1974, Ser. No. 450,894

Int. Cl.[2] G01J *3/50*; G01N *21/30*

U.S. Cl. 356—73 2 Claims

1. In an on-line system for continuously and simultaneously monotoring the color and opacity and brightness of a moving web including in combination, a sensing head disposed over said web, means on said head for illuminating a portion of said web below said head, an optical shoe disposed below the illuminated portion of said web, said shoe providing spaced black and white background within said illuminated portion of the web, a brightness detector unit, an opacity detector unit, a plurality of color detector units, each of said detector units having an optical axis, means mounting said brightness detector unit and the respective color detector units on said head with their optical axes directed toward said illuminated portion over said white background and means mounting said opacity detector unit on said head with its axis directed toward said illuminated web portion over said black background to permit simultaneous measurements of color and opacity and brightness to be obtained, said optical shoe comprising block having a plurality of sides, means on a first side of said block providing said black and white backgrounds, a white standard carried by a second side of said block, a black standard carried by a third side of said block, and means mounting said block



for movement selectively to position one of said sides in cooperative relationship with said sensing head.

3,936,190

FLUORESCENCE SPECTROPHOTOMETER FOR ABSORPTION SPECTRUM ANALYSIS

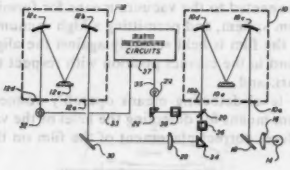
Yasushi Ohnishi, and Shunichi Matsuura, both of Katsuta, Japan, assignors to The Perkin-Elmer Corporation, Norwalk, Conn. and Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1974, Ser. No. 461,338

Claims priority, application Japan, Apr. 16, 1973, 48-42151

Int. Cl.[2] G01J *3/42*

U.S. Cl. 356—96 4 Claims



1. A fluorescence spectrophotometer adapted for analysis of absorption spectra, comprising:

a. first and second monochromators having respective entrance and exit slits;

b. a source of excitation radiation and means for directing radiation from said source into the entrance slit of said first monochromator;

c. a pair of light quantum meters;

d. a photoelectric detector disposed to receive a radiation output from one of said light quantum meters;

e. a beam splitter disposed in the path of radiation emanating from the exit slit of said first monochromator and directing a portion of such radiation to each of said light quantum meters;

f. respective absorption cells disposed in the paths of radiation from said beam splitter to said light quantum meters;

g. means for directing radiation output from the other of said light quantum meters through the entrance slit of the second monochromator; and

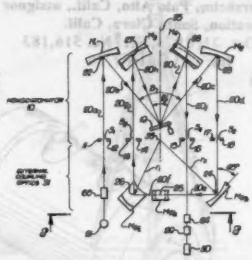
h. a second photoelectric detector disposed to receive radiation from the exit slit of said second monochromator.

3,936,191

OPTICAL ARRANGEMENT FOR DOUBLE-PASSING EBERT MONOCHROMATOR AND FOR COUPLING DOUBLE MONOCHROMATOR SYSTEMS

Vernon L. Chupp, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 22, 1974, Ser. No. 453,826
Int. Cl.² G01J 3/18
U.S. Cl. 356—101 9 Claims



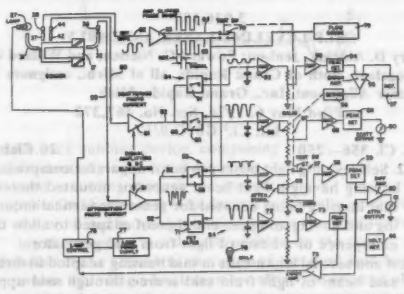
1. In combination with an additive dispersion, double-pass monochromator, and comprising
   a. means forming an entrance slit S_1, intermediate slits S_2 and S_3, and an exit slit S_4, said slits having curvature defining a circle,
   b. dispersing means in the beam path between the slits S_1 and S_2, and also in the beam path between the slits S_3 and S_4, and defining an aperture stop, and
   c. mirror means to reflect the beam for passage between slits S_1 and S_2 via the dispersing means and to reflect the beam for passage between slits S_2 and S_4 via the dispersing means,
   d. the improvement comprising coupling optical means located in the beam path between slits S_2 and S_3 for imaging S_2 onto S_3 and for reimaging the aperture stop back on itself.

3,936,192

OPTICAL FLUID CONTAMINATION AND CHANGE MONITOR

George F. Skala, Scotia, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Continuation of Ser. No. 847,675, Aug. 5, 1969. This application Apr. 19, 1973, Ser. No. 352,614
Int. Cl. G01n 21/00
U.S. Cl. 356—104 28 Claims



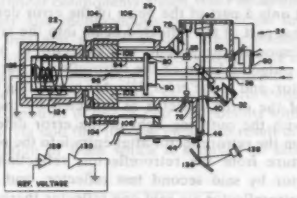
1. Apparatus for testing a sample of fluid material to determine at least one characteristic correlated to the effect the material has on light comprising a sealed chamber for containing therein a fluid sample to be tested and having inlet and outlet openings thereto for the fluid sample to be tested; a light source mounted exteriorly of said chamber, means responsive to light for producing a signal mounted exteriorly of said chamber; first optical fiber means extending from within said chamber to said light source; second optical fiber means extending from within said chamber to said light responsive means, a rotor mounted for rotation about an axis within said chamber; said rotor having at least two through passages, each extending between the chamber ends of said optical fiber means in spaced-apart positions of said rotor; a reference material in one or more of said passages, and means in other of said passages for holding a sample material; second light responsive means; third optical fiber means extending from within said chamber to said second light responsive means and having an off-axis orientation with respect to said first and second optical passages in said rotor providing respective light paths for each of said through passages with said third optical fiber means.

3,936,193

MULTIPLEX INTERFEROMETER

Gerald L. Auth, Laguna Beach, Calif., assignor to Eocom Corporation, Irvine, Calif.

Filed Feb. 13, 1974, Ser. No. 442,254
Int. Cl.² G01B 9/02; G02B 7/02
U.S. Cl. 356—106 S 12 Claims



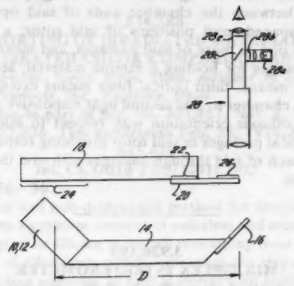
1. An interferometer for measuring the spectra of incident electromagnetic radiation, comprising:
   a. a rigid frame for supporting the interferometer;
   b. a fixed mirror assembly having a reflecting surface thereon adjustably mounted to said rigid frame;
   c. a mirror assembly movably mounted on said rigid frame and having a reflecting surface thereon orthogonally disposed to said fixed mirror;
   d. a beam splitter mounted on said rigid frame for separating the incident radiation into two parts and for subsequently recombining the two parts after reflection from the fixed mirror and the movably mounted mirror;
   e. means for movably supporting said movably mounted mirror assembly on said frame;
   f. means for providing a center of support for the movable mirror assembly continuously coincident with the center of gravity of said mirror assembly throughout the range of movement; and
   g. means mounted on said frame for transporting the movable mirror assembly with respect to the fixed mirror assembly and the beam splitter by providing a force exerted through the coincident center of support and center of gravity.

3,936,194

METHOD AND DEVICE FOR ASSEMBLING HOLLOW RETROREFLECTORS

Morton S. Lipkins, 3 Nemeth St., Malverne, N.Y. 11565

Filed May 31, 1974, Ser. No. 475,133
Int. Cl.² G01B 11/26
U.S. Cl. 356—153 8 Claims



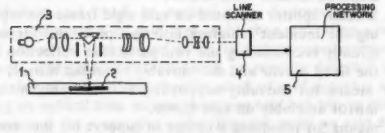
1. The method of testing large retroreflectors ideally having three reflectors in mutually perpendicular planes such as lateral transfer retroreflectors, including the steps of directing the beam of an error detector toward one reflector of the retroreflector as an incoming beam so that a portion thereof reaches the one reflector without obstruction and so as to produce an outgoing beam separated by a substantial lateral transfer distance from the incoming beam, fixing first and second optically flat test reflectors relative to each other so that they face precisely opposite directions and are off-set from each other by approximately said lateral transfer distance, disposing said first test reflector in position to intercept and reflect only a part of the beam of the error detector and to direct that part of the reflected beam into the error detector, and disposing the second test reflector in position to reflect the outgoing beam of the retroreflector back into the retroreflector, and in the error detector comparing the outgoing light of the error detector as reflected by the first test reflector with the outgoing light of the error detector as it returns from the retroreflector after entry into the retroreflector, departure from the retroreflector, reflection into the retroreflector by said second test reflector, and departure from the retroreflector via said one reflector thereof.

3,936,195

DEVICE FOR DETERMINING THE POSITION OF A STRUCTURAL ELEMENT

Eduard Roesch, La Chaux-de-Fonds, Switzerland, assignor to Dixi S.A., Le Locle, Switzerland

Filed July 31, 1974, Ser. No. 493,601
Claims priority, application Switzerland, Aug. 15, 1973, 11732/73
Int. Cl.² G01B 11/00
U.S. Cl. 356—170 3 Claims



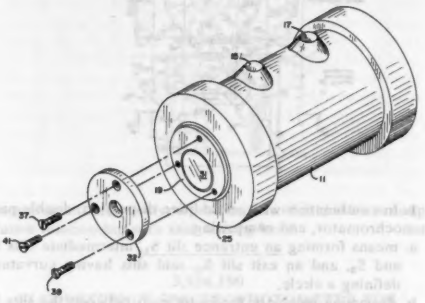
1. A device for determining the position of a structural element having at least a part provided with regularly spaced markings, said device comprising a plurality of photosensors in a linear array, said photosensors being regularly spaced from each other, means optically projecting at least two of said markings onto said photosensor array, the distance between adjacent photosensors being a subdivision of the distance between said two projected markings, means coupled to said array for scanning the photosensors, an envelope detector circuit coupled to receive output signals emitted by the photosensors, and output means responsive to said envelope detector for providing a pulse train having a length representative of the position of the structural element.

3,936,196

FLUID CHAMBER HAVING MANIPULATABLE WINDOW ELEMENTS

Kenneth A. Wickersheim, Palo Alto, Calif., assignor to Spectrotherm Corporation, Santa Clara, Calif.

Filed Oct. 21, 1974, Ser. No. 516,183
Int. Cl.² G01N 1/10
U.S. Cl. 356—246 2 Claims



1. A fluid containing cell, comprising:

an opaque fluid enclosure having an opening therein for introduction and removal of fluid therefrom and additionally having at least two small apertures therethrough on opposite walls thereof,

a circular transparent window element provided for each of said apertures, each of said window elements having an area at least several times that of its associated aperture, and

means associated with each of said apertures for selectively holding its associated circular window element in a fluid tight relationship thereagainst with a center of the circular window element being removed from coincidence with its associated aperture, whereby the holding means may be released to permit rotation of the circular window element when it becomes fogged in an area covering its associated aperture and thereby to permit a clean window area to be positioned over said aperture and resealed thereto without having to clean the window.

3,936,197

SELF-LEVELING LASER ASSEMBLY

Larry D. Aldrink, Jenison; Edward G. Nielsen, and Willard G. Vogelaar, both of Grand Rapids, all of Mich., assignors to Laser Alignment, Inc., Grand Rapids, Mich.

Filed May 6, 1974, Ser. No. 467,372
Int. Cl.² G01C 9/12
U.S. Cl. 356—250 20 Claims

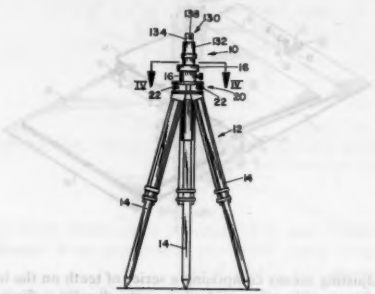
12. Self-leveling light beam projector apparatus comprising:

a housing having a light beam generator mounted therein, said housing being adapted for generally vertical mounting and having an upper end thereof adapted to allow the emergence of a beam of light from said generator;

first and second lens means in said housing adapted to direct said beam of light from said source through said upper end; and

pendulous mounting means mounting said first lens for movement with respect to said source, said pendulous mounting means including an elongated frame member supporting said first lens adjacent said source, said frame

member including means adjacent said upper end mounting said frame member for movement about mutually perpendicular axes with respect to said housing; means fixing said second lens with respect to said housing at a position intermediate said first lens and said upper end;



said mounting means being adapted to assume a predetermined position with respect to the vertical wherein said beam directed to said first lens is directed through said second lens and is emitted at said upper end in a vertical path with deviations of said housing from the vertical.

3,936,198

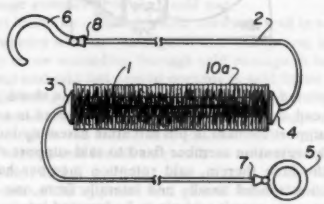
BACK RUBBING DEVICE

William F. Martin, Ridgewood, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 12, 1974, Ser. No. 496,462

Int. Cl.² A45D *33/02*; A47K *7/03*; A61H *7/00*

U.S. Cl. 401—8 **3 Claims**



1. A back rubbing device, comprising

a substantially cylindrical member;

a cord extending through the member;

a pair of rubber washer stop devices frictionally mounted on the cord and movably positionable on the cord for holding the member in a desired position on the cord;

handle means affixed to the ends of the cord said handle means including a hook member affixed to one end of the cord for hanging the device on a shower curtain rod; and

sleeve-type cover rubbing means on the member for application to the back of a user, said

cover rubbing means comprising sponge-type material for washing the back of the user.

3,936,199

METHOD OF AND APPARATUS FOR THE CLEANING OF TEXTILES

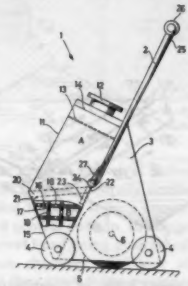
Erich Zimmermann, Friedrichshafen, Germany, assignor to Leifheit International Günter Leifheit KG, Nassau, Lahr, Germany

Continuation-in-part of Ser. No. 318,615, Dec. 26, 1972, abandoned. This application Mar. 22, 1974, Ser. No. 453,833

Claims priority, application Germany, Dec. 28, 1971, 2165008

Int. Cl.² A46B *11/00*

U.S. Cl. 401—40 **12 Claims**



1. An apparatus for producing foam for cleaning of textiles, especially of rugs and carpets, comprising applying means for applying foam to a surface to be cleaned; wall means defining two chambers each of which is adapted to accommodate one of two chemical components which react upon contact with one another and spontaneously produce foam for cleaning purposes; first and second passage means connecting said chambers with one another and with said applying means; and control means for selectively varying the effective cross-section of said first passage means so as to permit contacting of controlled amounts of one of said components with the other component via said first passage means, to result in spontaneous production of foam which is supplied to said applying means.

3,936,200

TOOTHBRUSH WITH DENTIFRICE ATTACHMENT

James L. O'Rourke, 6351 Memorial, Detroit, Mich. 48228

Filed Sept. 16, 1974, Ser. No. 506,009

Int. Cl.² A46B *11/04*

U.S. Cl. 401—184 **3 Claims**

1. A toothbrush comprising a brushing unit, a cartridge unit having a chamber adapted to contain a dentifrice, said chamber being defined at least in part by a squeezable wall, said brushing unit including a shank portion having a head at one end provided with bristles, a coupler at the other end of said shank portion releasably connected to one end of said cartridge unit, passage means from said chamber including passages through said one end of said cartridge unit, said coupler, said shank portion and said head to convey dentifrice to said bristles when forced from said chamber by the squeezing of said wall, said one end of said cartridge unit having a frangible seal across the passage therethrough initially closing said passage means and said coupler having a piercing element adapted to pierce said seal when said coupler and cartridge unit are connected together as aforesaid to open said passage

means, valve means normally closing said passage means and adapted to open when said wall is squeezed, and a check valve for said chamber adapted to close when said wall is squeezed and to open and admit air to said chamber when said wall is released after squeezing.

3,936,201

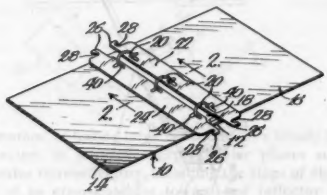
HANGER AND SHEET LIFTER FOR RING BINDER

William J. Kenney, Villa Park, and Lester K. Fleischmann, Highland Park, both of Ill., assignors to Standard Manifold Company, Chicago, Ill.

Filed July 18, 1974, Ser. No. 489,464

Int. Cl.² B42F *13/00*

U.S. Cl. 402—4 **3 Claims**



1. A hanger and sheet lifter in combination with a ring binder having an elongated spine, a plurality of openable rings on the spine and covers attached to the spine, comprising:

an elongated sheet lifter having a length greater than the length of said spine and a width greater than the ring size and less than the cover width,

a pair of hooks, one on each end of the lifter, opening in a direction away from the spine for receiving respective ones of spaced hanging rails for hanging support of the binder upon such rails;

means forming a plurality of elongated, uniform width closed end slots in the sheet lifter adjacent one edge thereof and extending in the direction of elongation of the lifter, each slot being located to receive one of said openable rings loosely threaded through the slot;

each slot having a length to allow the lifter to be shifted lengthwise of the binder spine in one direction to house one hook within the cover of the ring binder permitting standing the binder on end without interference between the housed hook and a supporting surface and to allow shifting of the lifter in opposite direction to expose both hooks outwardly of the binder for said hanging of the binder by the lifter upon rails, each lifter having means forming said slots with a closed leg extending in direction away from said adjacent one edge across the width of the lifter in alignment with the openable rings when both hooks are exposed outwardly of the binder permitting hanging of the binder by engagement of the spine on the lifters.

3,936,202

RING BINDER

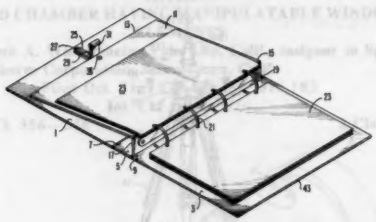
Peter Brajituli, Arguelles, 21, Oviedo, Spain

Filed Feb. 24, 1975, Ser. No. 552,124

Int. Cl.² B42F *13/00*

U.S. Cl. 402– 24 **4 Claims**

1. A ring binder comprising a pair of covers, a plurality of rings carried by the binder for retaining punched pages thereon between the covers, an outer spine disposed between and swingably connected to both of said covers, an inner spine overlying said outer spine when said binder is opened flat, said inner spine being pivotably connected to said binder at one edge, a support on at least one a substantially rigid sheet swingably connected at one of its edges to the other edge of said inner spine and free at its opposite edge, said rings being mounted on said inner spine, and means to adjust the elevation of the inner edge of said support relative to the rings whereby when the covers of the binder are open, the inner edges of pages resting on the first-mentioned inner edge will be at about the same level as the upper portions of the rings,



said adjusting means comprising a series of teeth on the inner side of one said cover, said series extending in a direction perpendicular to said edges, and a detent on said free edge of said sheet and selectively edngageable between any adjacent pair of said teeth.

3,936,203

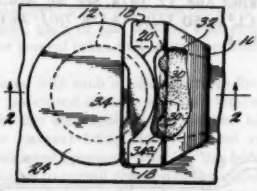
PIN RETENTION DEVICE

James E. Lowder, and Gary D. Perry, both of Lubbock, Tex., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Aug. 6, 1974, Ser. No. 495,215

Int. Cl.² F16B *21/00*

U.S. Cl. 403—154 **3 Claims**



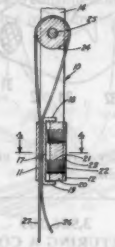
1. In a pinned joint: at least one pin having a shank and an enlarged head at one end, said pin being disposed in an aperture in a support element; a pin retention assembly including a flange-like retention member fixed to said support element adjacent the hole therein, said retention member having a flange portion spaced axially and laterally from one end of said hole so as to permit said pin to be inserted into said hole to a position in which a space is defined between said one end of said pin and the surface of the flange portion facing said support element, said head preventing further inserting movement of said pin, and a locking element releasably inserted into said space for engagement with said surface of said flange portion and with said one end of said pin so as to releasably lock said pin against withdrawal of said pin from said hole, said locking element residing in a notch in said pin, said notch having a first wall formed by said head and a second wall formed by the corresponding end of said shank, and means for applying transverse biasing forces to said locking element to frictionally engage the latter with said pin and with said retention member in order to hold said locking element in said space, said means including a plug of resilient material disposed in a pocket in said retention member and in engagement with said locking member.

3,936,204

TAPE CLAMP

Carleton E. Jennrich, St. Paul, Minn., assignor to Central Research Laboratories, Inc., Red Wing, Minn.

Filed Oct. 2, 1974, Ser. No. 511,244
Int. Cl.² F16G *11/00*; A44B *21/00*
U.S. Cl. 403—209 **12 Claims**



1. A clamp for securing a loop in a flat tape, said clamp comprising:

A. an elongated frame of rectangular cross-section having first through fourth side walls,

B. a pair of parallel spaced apart second and fourth side wall members interconnecting the opposite ends of the frame and two longitudinally spaced apart pairs of first and third side wall members interconnecting the opposite ends of the second and fourth side wall members and defining a pair of openings in the opposite first and third side walls of said frame intermediate of the ends thereof,

C. tape clamping means disposed within one end of said frame adapted for face-to-face abutment with the inside surface of the first frame side wall, said clamping means comprising:

1. a flat rectangular clamp strap plate member having a pair of inwardly directed flanges at its opposite ends and disposed within one end of said frame adapted for face-to-face abutment with the inside surface of the first frame side wall,

2. a tape clamp nut adapted for face-to-face abutment with the inside surface of the third frame side wall, said clamp nut having at least one internally threaded passage extending through said nut,

3. at least one opening in said third side wall in substantial registry with the passage in said clamp nut, and

4. a screw extending through said passage in said clamp nut and said last named opening in said frame side wall, the inner end of said screw engaging said clamp strap,

D. an arcuate tape loop anchoring member supported in the openings in the frame first and third side walls between the second and fourth side walls on an axis perpendicular thereto, and

E. means at the opposite end of said frame for connecting the clamp to another element.

3,936,205

CROWNED HEAD RIVETED JOINT

Eugene R. Speakman, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

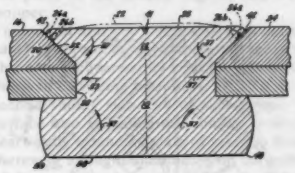
Continuation-in-part of Ser. No. 291,669, Sept. 25, 1972. This application June 3, 1974, Ser. No. 475,792
Int. Cl.² B25G *3/28*; F16B *7/04*
U.S. Cl. 403—279 **5 Claims**

1. A riveted joint for joining a plurality of members including:

a first member having a uniformly flared countersunk opening having maximum and minimum diameters defined therein and a cylindrical opening in axial alignment with said countersunk opening defined therein;

a second member having a cylindrical opening defined therein, said cylindrical opening in said second member being adjacent to and in registration with said cylindrical opening of said first member; and

a rivet inserted through said registered openings, said rivet having a shank and a head of shapes complementary to said openings which axially compressively engage said structural member openings and radially expand said



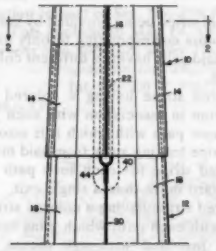
openings, the head of said rivet before driving having an upper surface shaped generally similar to the minor portion of a filled torus to form a crown having a generally planar raised central portion, the largest diameter periphery of said rivet head being positioned below the plane of the maximum diameter periphery of said countersunk opening and the crown being positioned above the plane of maximum diameter periphery of said countersunk opening.

3,936,206

TUBULAR POLE SLIP JOINT CONSTRUCTION

Raymond F. Meisberger, West Chester, Pa., assignor to Bruce-Lake Company, Coatesville, Pa.

Filed Feb. 18, 1975, Ser. No. 550,373
Int. Cl.² E04N *12/08*
U.S. Cl. 403—334 **10 Claims**



1. In a slip joint construction for a tubular pole useful as a utility pole and having a first tapered tubular pole section constructed of a pair of half shells joined at longitudinal seam welds, a second tapered tubular pole section constructed of a pair of half shells joined at longitudinal seam welds, said first pole section having a male portion at one end thereof, said second pole section having a female portion at one end thereof, said male portion being adapted to fit telescopically within said female portion with a friction tight slip joint connection, the improvement comprising a back-up strip welded to a longitudinal seam weld of said female section on the inside thereof, a longitudinal slot formed in the end of said male portion aligned with a longitudinal seam weld thereof, and a plate welded on the inside of said male portion and extending across and along the longitudinal extent of said slot to cooperate therewith to form a recess for receiving said back-up strip when the slip joint is made.

3,936,207

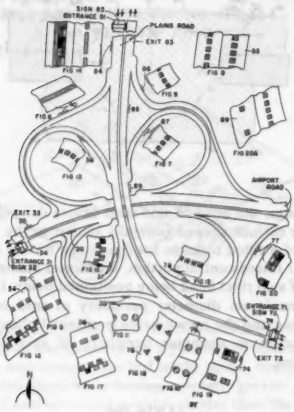
HIGHWAY COLOR CODE MARKING

James A. Sticha, Madison, Wis.

Continuation of Ser. No. 420,911, Dec. 3, 1973, abandoned. This application June 28, 1974, Ser. No. 483,965

Int. Cl.² E01F 11/00

U.S. Cl. 404—14 6 Claims



1. In a multilevel highway interchange having a plurality of paths, exits and entrances,

a multicolored stripe associated with each major path in the interchange,

the colors of said stripe being provided by marking means,

each of said colors corresponding to only one of said exits and each of said exits having a different color corresponding therewith,

said multicolored stripe having a colored stripe leading away therefrom in association with each path departing from said major path with which it is associated,

said colored stripe leading away from said major path being a multicolored stripe for each such path which may be followed toward more than a single exit,

said multicolored stripe having a colored stripe joining it in association with each path which joins said major path,

each entrance provided with sign means indicating the association of colors and exits.

3,936,208

REFLECTOR STUD

Frederick Baynes, Bowden, and James Munro Lawrie, Bolton, both of England, assignors to Dunlop Limited, London, England

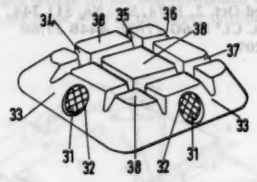
Filed Mar. 28, 1974, Ser. No. 455,905

Claims priority, application United Kingdom, Apr. 3, 1973, 15872/73

Int. Cl.² G08G 1/00

U.S. Cl. 404—16 9 Claims

5. A reflector stud comprising a housing which is of elastomeric material of a hardness of 60 to 95 I.R.H.D. and having a substantially flat under surface to be adhered to a road surface, said housing being divided by means of channels in said housing in the surface opposite to said flat under surface into zones which can deform substantially independently of each other, said housing having at least one side face extending substantially parallel to one of said channels, said side face



containing a location for a reflector element, and a reflector element mounted therein.

3,936,209

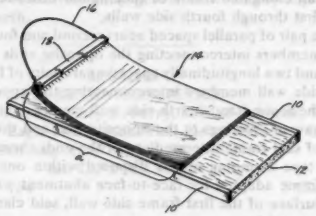
METHOD FOR TEXTURING A CONCRETE SURFACE

Colonel F. Krage, Sioux City, Iowa, assignor to Russell B. Dickinson, Des Moines, Iowa

Filed Mar. 7, 1974, Ser. No. 449,202

Int. Cl.² E01C 7/35

U.S. Cl. 404—75 1 Claim



1. A method for texturing concrete for use as a supporting surface for vehicle travel, comprising:

pouring uncured concrete on a supporting surface area, troweling said concrete to the approximate desired surface configuration,

dragging a texturing pad over the surface of said concrete in the normal direction of travel of vehicles on the resulting supporting surface, said texturing pad comprising a planar flexible sheet of backing material and a plurality of downwardly presented tufted clusters arranged in a matrix of rows and extending downwardly from said backing material; said clusters each comprising a base attached to the downwardly presented surface of said backing material and a plurality of blades extending downwardly therefrom in a circular array around said base to engage said concrete while moving thereover, each of said clusters being formed from a plastic material, each of said blades being bent intermediate its ends and being flexible so as to deflect irregularly in a plurality of directions whereby said plurality of blades create nonuniform marks in said concrete while being dragged thereover.

3,936,210

CONCRETE FLOAT AND ACCESSORY THEREFOR

Erwin L. Oehlerking, 9798 Oak, Des Plaines, Ill. 60016

Filed Nov. 13, 1974, Ser. No. 523,214

Int. Cl.² E01C 23/02

U.S. Cl. 404—89 6 Claims

1. A concrete finishing tool comprising

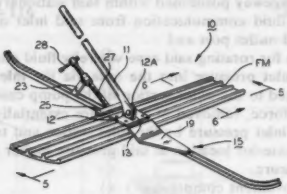
a. a float member having an elongated element secured thereto for manipulating said float member to and fro in compacting and finishing the surface of a concreted area;

b. means secured to said float member after the same has completed the compacting and finishing operations for describing lines of weakness in the concrete surface for

controlling the direction of cracks formed in the concreted area upon subsequent use thereof, said means comprising:

c. a rigid elongated surface engaging member deforming the surface of said concreted area before the curing of same;

1. said member having a length which is much greater than the width of said float member and having upturned ends for causing said member to ride smoothly on said surface in deforming the same;



d. means for detachably mounting said member to a side of said float member comprising an element bearing along one edge of said float member and a second element bearing along an opposed edge of said float member;

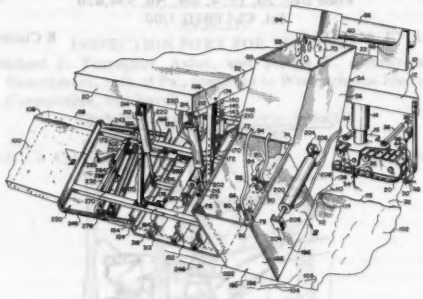
e. means extending between said elongated member and said second element for exerting pressure against said second element to hold said float member between both of said elements with said elongated member held in position with reference to said float member.

3,936,211

DRAINAGE DITCH MULE

David J. Miller, and Charles P. Miller, both of McHenry, Ill., assignors to Miller Formless Co., Inc., McHenry, Ill.

Filed Apr. 14, 1975, Ser. No. 567,500
Int. Cl.² E01C *19/48*
U.S. Cl. 404—104 **10 Claims**



10. A ditch paving tool adapted for attachment to the side frame of a prime mover to be transported thereby to form a continuous layer of concrete along a sloping wall and top birm of a graded ditch comprising:

an open-bottomed hopper for said concrete including front and rear spaced walls, an inside wall defining the edge of said concrete layer over said birm and a transversely adjustable outside wall defining the edge of said concrete along the bottom of said sloping wall of said ditch;

the front wall of said hopper having its bottom edge contoured to said graded ditch and birm;

the bottom edge of said rear wall being offset above the contour of the bottom edge of said front wall to define the contour of the top surface of said concrete layer;

said rear wall including an integral slip form means comprising a rearwardly extending flat plate conforming longitudinally to the contour of said bottom edge of said rear wall and having a second inside wall coextensive with the inside wall of said hopper defining the edge of said concrete layer over said birms;

said adjustable outside wall of said hopper having a pair of side walls attached to the front and rear edges and extending on the outsides of and in sliding contact with the front and rear walls of said hopper;

one of said sliding walls being adjacent said front wall of said hopper and having its bottom edge substantially on the plane of the bottom edge of said front wall of said hopper;

the second of said side walls being adjacent said rear wall of said hopper and having its bottom edge in sliding relationship over the rearwardly extending plate of said slip form;

a web wall extending rearwardly of the bottom edge of said second sliding side wall of said hopper with its under surface also in sliding relationship over the top of said rearwardly extending plate of said slip form and defining therewith a longitudinal offset on the under surfaces;

hold-down means to retain said web wall in said sliding relationship uon said rearwardly extending plate of said slip form under pressure of concrete thereunder;

a pan-shaped screed member trailing the rear end of said slip form and having a transverse width about equal to the width of said slip form along said sloping wall;

said screed member having a rounded front edge extending transverse and at an angle to the rear end of said slip form, said angle opening toward the top of the sloping wall of said ditch; and

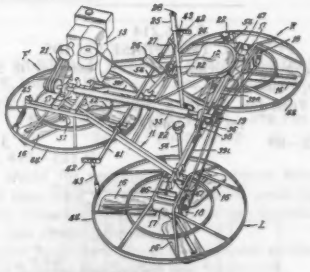
means to resiliently suspend said screed member behind said slip form in pressure contact with said concrete layer being formed and with its lower trailing corner over said off-set whereby to form a flat top surface in said concrete layer.

3,936,212

RIDE-TYPE SURFACE-WORKING MACHINES

Orville H. Holz, Sr., Palm Harbor, Fla., and Norbert J. Holz, Roselle, Ill., assignors to Orville H. Holz, Jr., Roselle, Ill., a part interest

Continuation-in-part of Ser. No. 258,589, June 1, 1972, abandoned. This application May 14, 1973, Ser. No. 359,740
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² E01C *19/22*
U.S. Cl. 404—112 **15 Claims**



1. A ride-type surface-working machine comprising three driven rotors rotating about widely spaced generally vertical axes with each rotor engaging the supporting surface with surface-working means distributed about the rotor axis and which follow an annular path along a supporting surface, a frame carried by the rotors and supporting driving means for the rotors and an operator's position, said rotors being mounted on the frame by means permitting relative tilting of each rotor about one or more horizontal axes, and control

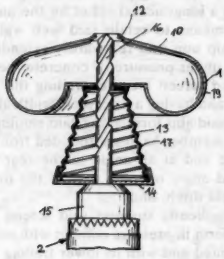
means operatively related to said frame and rotors and controllable by an operator riding on the frame for applying selectively tilting pressures to the rotors, the tilting pressure applied to a rotor tending to tilt the entire rotor unit about a horizontal axis, for controlling the posture and movement of the machine by variations of downward working pressure distribution; said control means including means for applying tilting pressures to all three rotors, to one side of each for forward movement of the machine and alternatively to opposite sides of each for rearward movement of the machine.

3,936,213

DEVICE FOR USE WITH DRILLS OR THE LIKE FOR THE COLLECTION OF WORKING DEBRIS

Friedrich Kappel, Sudring 3, 8941 Trunkelsberg, Germany

Filed Mar. 14, 1974, Ser. No. 451,272
Int. Cl.[2] B23B 47/00, 39/00
U.S. Cl. 408—67 1 Claim



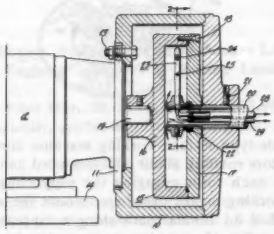
1. In combination a debris collection device and a tool having a rotatable working component which generates debris during operation, said collection device comprising a hollow collector housing which is disposed around said working component and rotatable therewith, said housing having a base, an annular side wall and an upper opening for receiving generated debris, said housing being mounted on a part of the tool through compression spring means which urges the housing in the direction of the operative end of the working component of the tool, said spring means being carried by a support plate which rests on said part of the tool, and a bellows disposed on said support plate and around the spring means, said spring means and support plate being positioned between the collector housing and the part of the tool upon which the support plate rests.

3,936,214

PUMPING TWO-PHASE FLUIDS

Joseph E. Zupanick, Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed Jan. 22, 1975, Ser. No. 542,996
Int. Cl.[2] F04D 29/08
U.S. Cl. 415—89 3 Claims



1. In a centrifugal pump comprising:

a generally cylindrical pump case rotatable about a central axis and defining a closed cylindrical main pump chamber,

a stationary arm extending from said central axis to a point within the case,

a central inlet port by which fluid enters said closed main pump chamber,

a fluid inlet orifice mounted on the outermost end of said stationary arm,

a fluid outlet port,

a passageway positioned within said stationary arm providing fluid communication from said inlet orifice to said fluid outlet port and

means for rotating said case whereby fluid charge is drawn at inlet pressure into the case via the inlet port, transported to the outer section of the pump case by centrifugal force, removed at a pressure essentially higher than the inlet pressure by the inlet orifice and transported to an exterior location at said pressure higher than the inlet pressure,

an improvement comprising:

a. a second fluid inlet orifice positioned on the stationary arm at a location essentially closer to the central axis of the rotatable case than the fluid inlet orifice recited above,

b. a second fluid outlet port, and

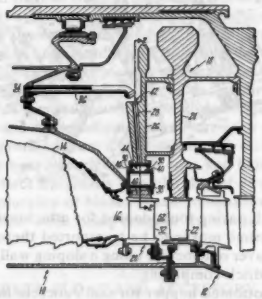
c. a second passageway positioned within said stationary arm providing fluid communication from said second fluid inlet orifice to said second fluid outlet port whereby a second fluid drawn into the case via the inlet port at inlet pressure is removed at a pressure essentially higher than the inlet pressure by said second fluid inlet orifice and transported via said second passageway and said second outlet port to a second exterior location at said pressure higher than the inlet pressure.

3,936,215

TURBINE VANE COOLING

Richard W. Hoff, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1974, Ser. No. 534,620
Int. Cl.[2] F01D 5/00
U.S. Cl. 415—11.5 8 Claims



1. In a gas turbine engine of the type having coolable turbine stator vanes and containing apparatus including conduit means leading from the compressor flow path for supplying cooling air to the coolable stator vanes, the improvement comprising:

compression means disposed between the conduit means and the coolable vane for raising the pressure of the cooling air to a value in excess of the pressure of the air within the compressor flow path; and

fixed flow straightening means operatively disposed be-

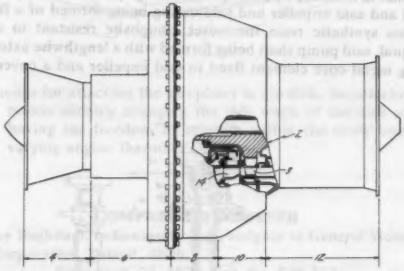
tween said compression means and the coolable vanes to recover the velocity pressure head of the cooling air which is discharged from said compression means.

3,936,216

BLADE SEALING AND RETAINING MEANS

James T. Dixon, Tequesta, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 21, 1974, Ser. No. 453,441
Int. Cl.² F04D 31/00; F01D 5/00
U.S. Cl. 415—116 6 Claims



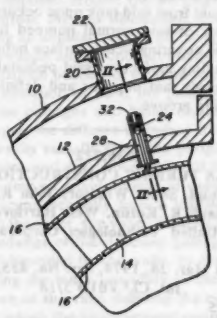
1. In combination, a rotor disk mounted for rotation, said rotor disk having slots provided in the periphery thereof, rotor blades, said rotor blades having root portions shaped to fit the slots in the periphery of the disk, each blade having a small coverplate fixed to its root portion, each small coverplate being contoured so that it extends over the edges of its blade slot for bearing against the side of the disk and having inner and outer edges, a full ring coverplate being positioned adjacent said rotor disk said full ring coverplate having a cylindrical member extending therefrom which engages all of the small coverplates at a point between the inner and outer edges of the root portions and means for providing a biasing force against the small coverplates through said cylindrical member.

3,936,217

INSPECTION PORT FOR TURBINES

Michael J. Travaglini, Aston, and Joseph F. Abbruzzesi, Swarthmore, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1975, Ser. No. 546,067
Int. Cl.² F01D 25/00
U.S. Cl. 415—118 5 Claims



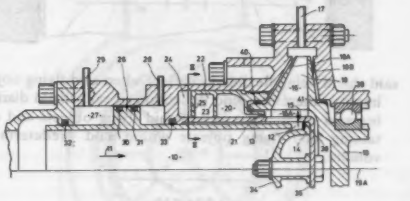
1. In a turbine having casing means, with an inspection port, the combination comprising an elongated tubular member extending through at least a part of the casing means in alignment with an opening giving access to the interior region to be inspected, an elongated sealing member extending through said tubular member and engaging said opening in sealing relation, a closure member substantially closing the outer end of the tubular member, and spring means in the tubular member disposed to apply sealing pressure to said sealing member and to apply a force to said closure member to positively retain it in place.

3,936,218

FLUID SYSTEMS

John Rodney Dyson Fuller, Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed June 4, 1974, Ser. No. 476,336
Claims priority, application United Kingdom, June 12, 1973, 27957/73
Int. Cl.² F04D 29/66
U.S. Cl. 415—119 4 Claims



1. A hydraulic system comprising a duct for the containment of liquid, an orifice in the wall of the duct, a compartment connected to the duct through the orifice and means for generating a partial vacuum which causes a discontinuity in the liquid in the duct such that the discontinuity contains only liquid vapor, the orifice being disposed adjacent said means so that generation of the discontinuity causes the compartment to be substantially emptied through the orifice, and the orifice and the compartment being so sized and disposed that any shock wave propagated upon sudden disappearance of the discontinuity will be dissipated in part at the orifice and in part upon filling of the compartment, and said system further comprising a second compartment connected to the first compartment through a second orifice, the arrangement being such that generation of the discontinuity causes the second compartment to be substantially emptied through the second orifice and any shock wave propagated upon disappearance of the discontinuity will be dissipated in part at the first orifice, in part at the second orifice and in part upon filling of the second compartment.

3,936,219

FLEXIBLE TURBINE MISSILE SHIELD

Martin E. Holmes, Philadelphia, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1974, Ser. No. 478,130
Int. Cl.² F04D 29/70
U.S. Cl. 415—121 G 16 Claims

1. A shield for restraining flying objects having kinetic energies associated therewith, said shield enclosing a predetermined volume around a device having movable elements therein, said shield comprising:

a support framework disposed about said device, and,

a plate member attached to said framework,

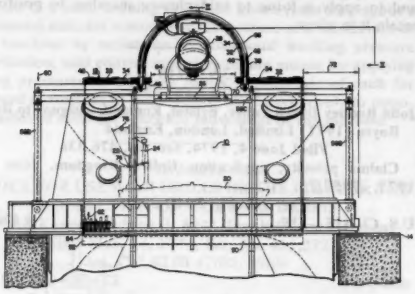
said support framework comprising:

a first support member circumferentially disposed about said device, and,

a second support member longitudinally disposed about said device, said second support member being substantially transverse to said first support member, said second support member being connected to said first support member,

said first and said second support members defining at least one opening therebetween, said plate member

being disposed so as to cover said opening between said first and said second support members,



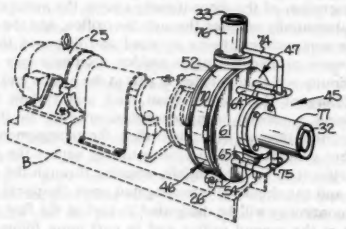
said shield being flexible to deflect when said flying objects impinge thereinto, said deflection of said shield dissipating said kinetic energies of said flying objects and containing said flying objects within said predetermined volume.

3,936,220

JACKET CONSTRUCTION FOR FLUID-CIRCULATING PUMPS

James R. Henderson, Charlotte, N.C., assignor to Controls Southeast, Inc., Charlotte, N.C.

Filed Aug. 26, 1974, Ser. No. 500,745
Int. Cl.² F01D *5/08*
U.S. Cl. 415—178 **19 Claims**



1. In a fluid-circulating pump of the in-line type having a body provided with inlet and outlet portions projecting outwardly at opposite ends of the body, and impeller means in said body for pumping fluid therethrough; the combination therewith of means substantially surrounding said pump body and outwardly projecting inlet and outlet portions in heat-transferring relation thereto and cooperating with said pump for directing a temperature controlling fluid in heat-transferring relation thereto and comprising a housing of heat-conductive material including inner and outer walls having therebetween at least one fluid passageway provided with inlet and outlet ports for circulation of the temperature controlling fluid through said passageway.

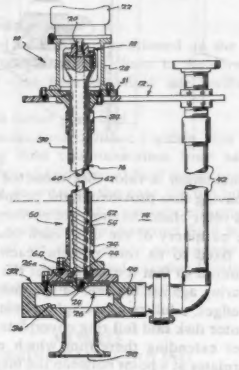
3,936,221

VERTICAL CANTILEVER PUMP

Valenteen S. Lobanoff, Seneca Falls, N.Y., assignor to Goulds Pumps, Inc., Seneca Falls, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,017
Int. Cl.² F04D *1/00, 7/00*
U.S. Cl. 415—200 **2 Claims**

1. A vertical cantilever pump adapted for use in pumping liquids of a corrosive and/or abrasive nature, said pump comprising a vertically downwardly extending cylindrical support pedestal having a pump casing adjacent its lower end for positioning same within a bath of liquid confined by a tank, said pump casing having an opening in an upper wall thereof and a liquid inlet and a pumped liquid outlet, and a pump drive shaft freely extending downwardly through said pedestal and said pump casing opening for supporting an impeller within said pump casing, said pedestal being arranged in flow communication with said pump casing through said pump casing opening and said pedestal being of a substantially closed construction whereby pumped liquid escaping from said pump casing through said pump casing opening upwardly along said pump shaft and into said pedestal forms a tubular column of liquid tending to reach a normal height proportional to normal pumped liquid discharge pressure, said pedestal and said impeller and said casing being formed of a fiber glass synthetic resin thermoset composite resistant to said liquid, said pump shaft being formed with a lengthwise extending metal core element fixed to said impeller and a covering



sleeve bonded to said core element for shielding same from contact with said liquid and cooperating therewith to define an extremely rigid pump shaft, said covering sleeve being formed of a wound fiber glass synthetic resin thermoset composit resistant to said liquid, said covering sleeve having its surface shaped to define a pump device cooperating with a relatively closely positioned bounding surface of said pedestal for creating a downwardly directed force acting on said pumped liquid escaping from said pump casing for maintaining said column at a height below an abnormal height permitting escape of liquid from said tank upon occurrence of a back pressure in excess of said normal pumped liquid discharge pressure, and said covering sleeve surface being tapered relative to said bounding surface of said pedestal in a direction downwardly towards said impeller and defining a spiralwise extending pumping groove.

3,936,222

GAS TURBINE CONSTRUCTION

Herbert F. Asplund, South Windsor; John R. Hess, Middletown, and Joseph R. Kozlin, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

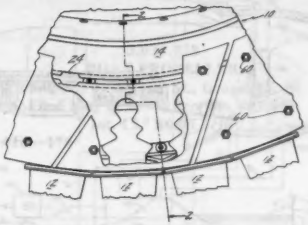
Filed Mar. 28, 1974, Ser. No. 455,838
Int. Cl.² F01D *5/18*
U.S. Cl. 416—95 **6 Claims**

1. In a gas turbine engine, a rotatable disk and blade assembly comprising:

a disk having a side which is essentially perpendicular to the axis of rotation of the disk and which includes a track incorporated therein;

a plurality of blades attached to and extending radially from the disk;

a plurality of sideplates in surface contact with the side of the disk; and



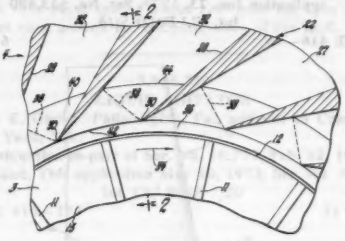
means for attaching the sideplates to the disk, the attaching means slidably engaging the side track of the disk and having the freedom to relocate within the track under varying engine thermal conditions.

3,936,223

COMPRESSOR DIFFUSER

Samy Baghdadi, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 23, 1974, Ser. No. 508,352
Int. Cl.² F04D 29/44
U.S. Cl. 415—211 2 Claims



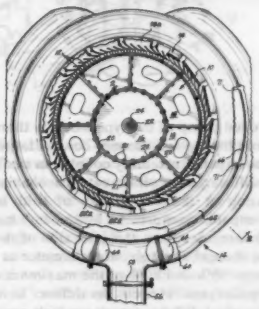
1. A centrifugal compressor comprising, in combination, a rotor operable to discharge gas at high velocity from the periphery of the rotor with radial and tangential components of velocity and a stator enclosing the rotor, the stator including a diffuser disposed around the periphery of the rotor to receive and diffuse the gas discharged from the rotor; the diffuser defining an annular aray of diffusing passages extending radially outwardly and circumferentially from the rotor, at least the downstream portion of each passage being divergent in area in the direction of flow; the passages merging at the entrances to the passages and being discrete at the outlets from the passages; the diffuser including front and rear walls extending generally radially from the periphery of the rotor defining the front and rear boundaries of the diffusing passages and including an annular array of vanes each extending radially and circumferentially from a leading edge and from one said wall to the other, the vanes defining the radially outer and inner boundaries of the diffusing passages; each passage having a throat bounded by the walls, by the leading edge of the vane defining the inner boundary of the passage, and by the inner surface of the vane defining the outer boundary of the passage; in which the improvement comprises an annular flow splitter disposed centrally between the front and rear walls, extending circumferentially across each passage and extending radially through the passage throats, the inner and outer perimeters of the flow splitter being substantially at the inner and outer boundaries of the throats, respectively, the flow splitter dividing the entrance to each diffusing passage into a front passage bounded by the front wall and the splitter and a rear passage bounded by the rear wall and the splitter, so as to reduce flow separation in the diffuser.

3,936,224

POWER TURBINE

Oscar M. Nordquist, 1931 N. Rainier, Bremerton, Wash. 98310

Filed July 25, 1974, Ser. No. 491,788
Int. Cl.² F01D 1/18
U.S. Cl. 415—203 5 Claims



1. A water turbine apparatus, comprising:

a. a main turbine wheel mounted for rotation about a generally vertical axis;

b. a plurality of turbine blades mounted to the turbine wheel at spaced intervals along the circumference of the wheel so as to travel a circular tangentially forward path with said wheel about said axis of rotation;

c. an annular water inlet distribution structure positioned generally circumferentially around said turbine blades and defining a generally annular water distribution chamber also positioned circumferentially around said turbine blades;

d. a vane structure positioned circumferentially around said turbine blades and defining a plurality of water nozzles positioned substantially circumferentially around said blades and extending from said distribution chamber to said blades in a tangentially forward and inward direction,

e. a turbine blade housing structure having a generally annular configuration and having top and side walls substantially enclosing the circular path of said turbine blades so as to fit closely adjacent the top and sides of the blades and providing a downwardly open water discharge passage below said turbine path,

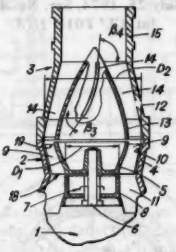
f. each of said turbine blades having a generally concave impact surface which is curved in a vertical plane with the upper end portion of said curve having a substantial upward and rearward slope, whereby water impacting said impact surface is directed downwardly through said discharge passage.

whereby water flowing under pressure from said distribution chamber travels through said vane water passages to impact said turbine blades to cause rotation of said wheel, with the water being discharged from the blades downwardly through said discharge passage.

3,936,225
DIAGONAL IMPELLER PUMP

Bo Gustaf Stjernstrom, Tyreso, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 1, 1974, Ser. No. 465,785
Claims priority, application Sweden, May 9, 1973, 7306490
Int. Cl.² F04D 1/04, 29/26
U.S. Cl. 415—207 2 Claims



1. An improved pump of the type wherein there is provided an impeller unit having a stationary conical impeller housing, a motor driven impeller rotatably coupled in said housing, and a stationary diffuser unit which extends coaxially with said impeller housing at the outlet side of said impeller, and wherein said impeller comprises a hollow hub having a cross-section which increases from the inlet side of the impeller to the outlet side thereof, the hub outer diameter at the inlet side ranging between 40% and 80% of the maximum outer diameter of said impeller, and wherein the diffuser unit comprises a substantially conical diffuser housing which converges in the flow direction of the pumped medium and which has arranged therein a hollow central body said impeller comprises:

a plurality of radial curved blades on said hollow hub, the outer edges of which lie in a conical imaginary surface in the direction of flow such that the angle between a plane extending at right angles to the pump shaft and a plane tangential to said impeller blades at the outlet edge of the blades lies between 15° and 90° while the corresponding angle at the inlet edge of the blades lies between 10° and 30°; and

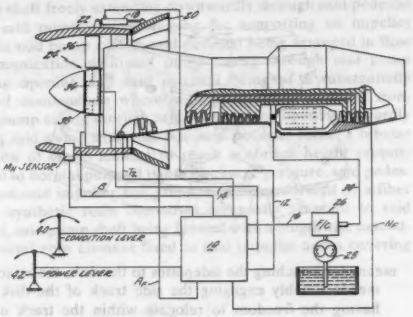
a plurality of radial curved guide vanes for holding said central body centered in the diffuser housing, said guide vanes having an inlet angle between 30° and 60° and an outlet edge angle between 75° and 105°.

3,936,226
CONTROL SYSTEM FOR VARIABLE PITCH FAN PROPULSOR WITH REVERSE PITCH

Kermit I. Harner, Windsor, and Roy W. Schneider, Ellington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 7, 1974, Ser. No. 477,533
Int. Cl.² B63H 3/10; F02C 9/02; B64C 11/44
U.S. Cl. 416—28 4 Claims

1. For a ducted fan propulsor for aircraft having variable pitch blades movable to a reverse position through feather and driven by a free turbine of a turbine type power plant, coordinated control means for controlling the pitch of said blades and the flow of fuel to said power plant, said coordinated control means for controlling fuel flow includes scheduling means responsive to power lever position, flight Mach No. and power plant inlet temperature for producing a first signal, means responsive to free turbine speed for producing a second signal, means responsive to said first signal and said second signal for producing an output signal for controlling fuel flow, said coordinated control means for controlling pitch of the blades being responsive to power lever position and flight Mach No., said coordinated control means having reverse power interlock to reduce forward thrust during a landing operation, to coordinate the fuel flow and reverse pitch by having said fuel flow further controlled by the blade angle of

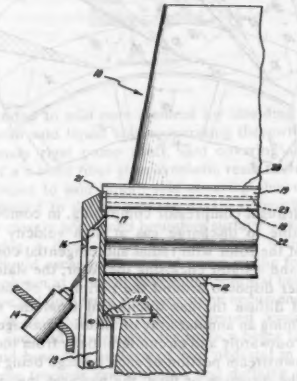


said blades and the pitch controlled by power lever position, and an engine operating parameter.

3,936,227
COMBINED COOLANT FEED AND DOVETAILED BUCKET RETAINER RING

Lawrence A. Wojcik, Peabody, Mass., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 385,096, Aug. 2, 1973. This application Jan. 23, 1975, Ser. No. 543,480
Int. Cl.² F01D 5/18
U.S. Cl. 416—95 6 Claims



1. In a gas turbine wherein a turbine disk is mounted on a shaft rotatably supported in a casing, said turbine disk extending substantially perpendicular to the axis of said shaft and having turbine buckets mounted on the outer rim thereof, each bucket having a dovetailed root, means located radially inward of said buckets adjacent said turbine disk for introducing liquid coolant within said turbine in a radially outward direction to an annular gutter to enter open-circuit distribution paths by which said coolant reaches and cools each of said buckets, each distribution path comprising a cooling channel/manifold system in one bucket for traversal of a portion of the bucket by the coolant followed by discharge thereof from the bucket, the improvement comprising, at least one one-piece annular member attached to said outer rim solely by means of an overlap in the generally axial direction between an annular portion of said member and an annular portion of said outer rim, the overlap being an interference fit conformed as a reverse angle, said annular member having an

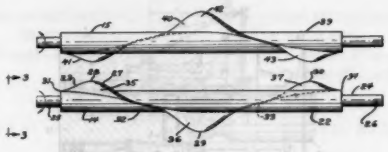
annular gutter formed therein, said gutter being in flow communication with the open-circuit coolant distribution paths via circumferentially spaced feed holes in said annular member.

3,936,228

BOAT PROPELLER

Paul P. Symbol, 378 N. Slusser St., Grayslake, Ill.

Filed May 8, 1974, Ser. No. 467,866
Int. Cl.² B63H 1/14
U.S. Cl. 416—176 8 Claims



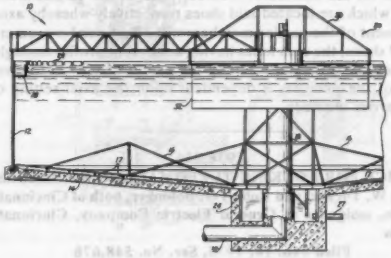
1. A boat propeller comprising an elongated shaft and three vanes extending outwardly from the surface of the shaft at axially spaced positions there along, the intersection of each vane with the shaft lying along a common helix extending around the shaft, each vane having a smoothly curved outer periphery which extends outwardly from the shaft to form an apex for the vane and then inwardly toward the shaft, the apex of each vane being spaced about 120° from the apex of each adjacent vane around the circumference of the shaft.

3,936,229

LIQUID AGITATOR

George E. Glover, Philadelphia, Pa., assignor to Crane Co., New York, N.Y.

Continuation-in-part of Ser. No. 10,777, Feb. 12, 1970, abandoned. This application May 10, 1973, Ser. No. 357,401
Int. Cl.² B01F 7/20
U.S. Cl. 416—178 11 Claims



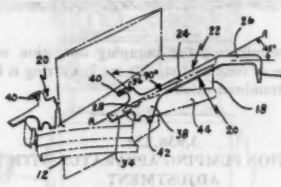
1. A liquid agitator of the type having at lease one paddle mounted for rotation about an axis in a fluid receiving chamber, said paddle having a paddle area which extends radially from said axis, said paddle area being divisible into radial increments, each increment generating an annular volume when said paddle is rotated about said axis, said paddle including at least one pale element in each radial increment, each said pale elements having a predetermined size, shape and disposition for dissipating kinetic energy in a liquid when said paddle is rotated through said liquid whereby the energy dissipated per unit volume of liquid in said annular volumes through which each of said pale elements of said paddle travels is substantially the same.

3,936,230

SELF-SUPPORTED, SELF-LOCATING SEAL FOR TURBINE ENGINES

Augustus M. Helmintoller, Jr., Loveland, and Gary B. Manharth, Milford, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 9, 1974, Ser. No. 468,357
Int. Cl.² F01D 5/22
U.S. Cl. 416—193 R 1 Claim



1. A self-locating, self-supporting seal adapted to fit within the cavity formed between the midspan joints of adjacent blades of a turbine engine comprising an elongated body formed of a synthetic plastic material having an elongated central portion and a pair of end segments, said central portion lying in a preselected plane and having a longitudinal axis, one of said end segments being of a length substantially half the length of said central portion and being positioned at substantially 45° with respect to said longitudinal axis of said central portion, said one segment having an end portion, said end portion of said one end segment lying in a plane extending substantially 90° from said plane of said central portion in order to provide a rigid support for said seal within said turbine blade cavity, said other end segment being formed of three protrusions, the first of said protrusions being of a substantially rectangular configuration and an extension of said central portion, located along said longitudinal axis of said central portion and lying completely in the same plane as said central portion, the second of said protrusions being positioned at an angle of substantially 90° with respect to said longitudinal axis of said central portion and having an end lying in a plane extending substantially 90° from the plane of said central portion, and the third of said protrusions being located substantially opposite said second protrusion and having an end having a pair of extensions thereon, said pair of extensions extending substantially 90 ° from the plane of said central portion, whereby upon positioning of said seal within the cavity formed between the midspan joints of adjacent blades of a turbine engine said end segments of said seal by their geometry, utilize the centrifugal forces acting theron to fixedly secure said seal in position.

3,936,231

OIL WELL PUMPOFF CONTROL SYSTEM

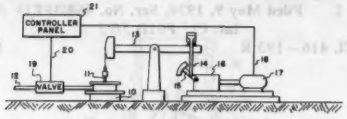
Bobby L. Douglas, Garland, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 469,264, May 13, 1974, Pat. No. 3,930,752, which is a continuation-in-part of Ser. No. 365,881, June 1, 1973, Pat. No. 3,854,846. This application Nov. 5, 1974, Ser. No. 520,993
Int. Cl.² F04B 49/00
U.S. Cl. 417—12 15 Claims

1. A system for controlling the operation of a well pumping installation including an hydraulically actuated downhole pump, a fluid pressurizer communicating with said pump, a motor for operating said pressurizer, and a well fluid flowpipe; said system comprising:

flow detection means located in the well flowpipe and arranged to be responsive to fluid flow therethrough;

signal means connected to said flow detection means and arranged to generate signals indicative of said response; means for receiving said signals and determining if the percentage of time during a given time interval that such signals are occurring is below a predetermined value; and,



means for terminating the pumping operation when the percentage of time said signals are occurring is less than the predetermined value.

3,936,232

FUEL INJECTION PUMPING APPARATUS WITH TIMING ADJUSTMENT

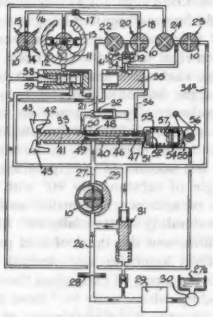
Dorian Farrar Mowbray, Burnham, England, assignor to C.A.V. Limited, Birmingham, England

Filed Apr. 9, 1974, Ser. No. 459,342

Claims priority, application United Kingdom, Apr. 14, 1973, 18096/73

Int. Cl.² F04B *23/12, 19/02, 3/00*

U.S. Cl. 417—206 4 Claims



1. A liquid fuel injection pumping apparatus comprising an injection pump adapted to be driven in timed relationship with an engine to which fuel is to be supplied, a shuttle slidable within a bore, means for conveying fuel displaced by movement of the shuttle from one end of the bore to the injection pump during a filling stroke of the injection pump, the excursion of the shuttle being indicative of the amount of fuel supplied to the engine, fluid pressure operable means operatively associated with the injection pump for effecting an adjustment to the timing of injection of fuel to the engine, a fluid pressure control circuit for controlling the fluid pressure applied to said fluid pressure operable means, said control circuit comprising a groove formed on the shuttle, a pair of ports formed in the wall of the bore, said ports being placed in variable communication with each other by the groove to control a flow of liquid between said ports and thereby the pressure applied to said fluid pressure operable means, whereby the fluid pressure applied to said fluid pressure operable means varies in accordance with the amount of fuel supplied to the engine.

3,936,233

FUEL INJECTION PUMPS FOR INTERNAL COMBUSTION ENGINES

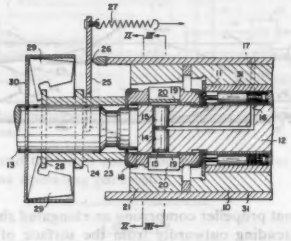
Jean-Claude Bonin, Blois(Loir-et-Cher), France, assignor to Roto Diesel, Clichy (Hauts-de-Seine), France

Division of Ser. No. 450,431, March 12, 1974. This application Jan. 23, 1975, Ser. No. 543,534

Claims priority, application France, Mar. 14, 1973, 73.09050

Int. Cl.² F04B *19/02, 29/00*

U.S. Cl. 417—214 6 Claims



1. A fuel injection pump of the kind intended for supplying fuel to internal combustion engines and comprising a body part, a distributor member rotatable within the body part and adapted to be driven in timed relationship with an associated engine, a transverse bore in the distributor member, a pair of pumping plungers reciprocally mounted within the bore, a pair of shoes slidable in radial slots at the outer ends of said bore, said shoes engaging the plungers during inward movement of the shoes, cam engaging means carried by said shoes, an annular cam ring surrounding said distributor, cam lobes formed on the internal periphery of said cam ring and engaging with said cam engaging means during rotation of the distributor member to impart inward movement to said shoes and plungers, fuel delivery means for conveying fuel displaced from said bore to a plurality of fuel outlets in turn, fuel inlet means for supplying fuel to said bore during the periods when the plungers can move outwardly, a carrier member axially slidable on the distributor member, slots in the carrier member in which are located said shoes respectively whereby axial movement of the carrier members will effect axial movement of said shoes, the cam lobes having a different profile throughout their axial length, whereby the extent of outward movement of the plungers is dependent upon the axial setting of said carrier member.

3,936,234

DEVICE FOR LOCKING TURBOMACHINERY BLADES

James W. Tucker, and Robert O. Bobinger, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 10, 1975, Ser. No. 548,678

Int. Cl.² F01D *5/32*

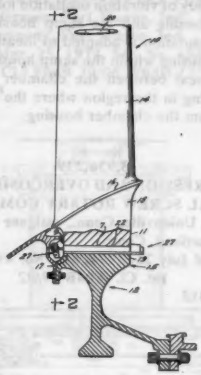
U.S. Cl. 416—220 R 12 Claims

1. A blade locking device for locking radially projecting blades in a rotor, each blade having a dovetail tang at its radially inward end including a forward end face and an aft end face and the rotor having dovetail slots extending across its periphery from one side of the rotor to the other with outwardly facing abutment surfaces on each side of said rotor proximate said dovetail slot, each dovetail tang being received in one of said slots providing a radial space between the tang and the bottom of the slot, said device comprising:

a pair of retaining members in a first position residing in and extending through said radial space, one circumferentially spaced from the other, each having enlarged forward end and aft end portions which protrude from said

slot, each of said enlarged end portions providing inwardly facing abutment surfaces;

spacer means disposed between said retaining members for maintaining said retaining members circumferentially spaced from each other and for maintaining said inwardly



facing abutment surfaces in confronting and overlapping relationship with said outwardly facing abutment surfaces; and

means for preventing relative axial movement between said spacer means and said retaining members.

3,936,235

FUEL OIL SUPPLY MEANS

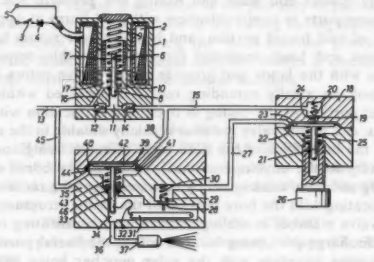
Peder Larsen, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Aug. 7, 1974, Ser. No. 495,386

Claims priority, application Germany, Aug. 21, 1973, 2342112

Int. Cl.² F04B *49/00*

U.S. Cl. 417—279 **3 Claims**



1. A fuel oil supply assembly comprising a magnetic pump having a resilient oscillatory system, said pump having a suction line and a delivery line, a nozzle at the terminal end of said delivery line, a pressure regulator in said delivery line having a flow passage, flow restricting means in said passage including a valve means, spring means biasing said valve means in an opening direction, a storage chamber in said delivery line between said pump and said pressure regulator, said storage chamber having resilient wall means, a suction chamber adjacent said storage chamber, said suction chamber and said storage chamber being separated by said resilient wall means, said suction chamber having fluid communication with said suction line.

3,936,236

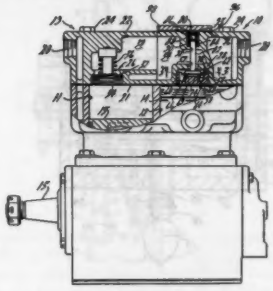
COMPRESSOR INTAKE VALVE AND CONTROL MEANS

Richard J. Day, and LeRoy Yanik, both of Owosso, Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Continuation of Ser. No. 296,016, Oct. 10, 1972, abandoned. This application May 22, 1974, Ser. No. 472,112

Int. Cl.² F04B *49/00, 21/02*

U.S. Cl. 417—298 **2 Claims**



1. In a reciprocating compressor having a body portion forming a pair of cylinders, a removable unitary head having a flat bottom surface covering the open ends of said cylinders, said head having a flat top surface parallel to said bottom surface, a pair of first cylindrical chambers formed in said unitary head and opening to said bottom surface and said pair of cyclinders, respectively, a pair of second cylindrical chambers axially aligned with said pair of first cylindrical chambers, respectively, and opening to said top surface of said head, an intake chamber formed in said head and communicating with said pair of first chambers, a plate removably connected to said top surface of said head and closing said pair of second chambers, inlet valve means removably disposed in each of said first chambers and being disposed between said cylinders and said intake chamber, means formed by said plate and connecting said pair of second chambers to each other and to a source of fluid pressure, and plunger means removably disposed in each of said second chambers and within said unitary head and including pressure responsive portions simultaneously responsive to pressure in said second chambers, said plunger means including portions projecting from said second chambers into said first chambers and being movable toward said inlet valve means to hold the latter simultaneously open in response to a predetermined pressure in said source, said inlet valve means being separately removable independently of said plunger means upon removal of said removable head and said plunger means being separately removable independently of said valve means upon removal of said plate.

3,936,237

MEMBRANE-AIR PUMP ADAPTED TO FUNCTION AS A TACHOMETER

Asoke Chattopadhayay, Norf, and Georg Habel, Nievenheim, both of Germany, assignors to Deutsche Vergaser GmbH & Co. K.G., Neuss, Germany

Filed Nov. 15, 1973, Ser. No. 416,283

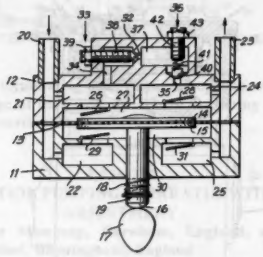
Claims priority, application Germany, Mar. 14, 1973, 2312607

Int. Cl.² F04B *49/00; G01D 9/00; G01P 3/26*

U.S. Cl. 417—311 **1 Claim**

1. In a positive displacement pump, a first flow circuit extending from a flow inlet at the suction side of the pump to a discharge at the delivery side of the pump providing flow or pressure values serving a speed-dependent guide values for control or regulating apparatus, said first flow circuit including a pump chamber; a flexible membrane dividing said pump

chamber into first and second chamber portions sealed from each other; a first suction chamber communicating said first chamber portion with said flow inlet; a first pressure chamber communicating said first chamber portion with said pump discharge, a second suction chamber communicating said second chamber portion with said flow inlet; and a second pressure chamber communicating said second chamber portion with said pump discharge, the improvement comprising: a second flow circuit extending from said first pressure chamber upstream of said pump discharge to said first suction



chamber; relief pressure valve means in said second flow circuit inhibiting flow therethrough below a predetermined low flow or pressure value at said pump discharge and permitting return flow therethrough from said first pressure chamber to said first suction chamber at and above said predetermined value; and adjustable throttle means in said second flow circuit located intermediate said relief pressure valve means and said first suction chamber and operable above said predetermined low flow or pressure for adjustably restricting the flow through said second flow circuit and controlling the flow or pressure values at said pump discharge.

3,936,238

ROTARY COMPRESSORS

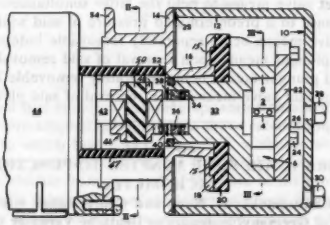
Henryk Wycliffe, Crawley, England, assignor to BOC Limited, trading as Edwards High Vacuum International, Crawley, England

Filed May 8, 1974, Ser. No. 467,924

Claims priority, application United Kingdom, May 9, 1973, 22247/73

Int. Cl.² F04B *17/00*

U.S. Cl. 417—312 **19 Claims**



1. An oil sealed rotary compressor including a sealed sump housing having acoustically-dense walls and acting as an oil sump,

a compression chamber housing positioned in the interior of the sealed sump housing, all external surfaces of the chamber housing being spaced from the adjacent surfaces of the sump housing and separated therefrom by an insulating material at points of interconnection between said sump housing and said chamber housing to absorb vibration between said housings,

a rotor, mounted for rotation within the compression chamber,

a rotary drive shaft connected to the rotor, which drive shaft projects from the chamber,

means for driving the rotary drive shaft, and

at least one body of vibration insulation located between the chamber housing and the sump housing, in which the vibration insulation is adapted to locate and support the chamber housing within the sump housing, and to form a fluid-tight seal between the chamber housing and the sump housing in the region where the rotary drive shaft projects from the chamber housing.

3,936,239

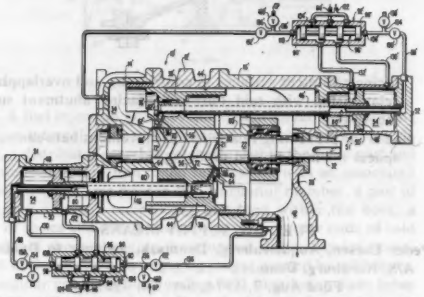
UNDERCOMPRESSION AND OVERCOMPRESSION FREE HELICAL SCREW ROTARY COMPRESSOR

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed July 26, 1974, Ser. No. 492,084

Int. Cl.² F04B *49/02*

U.S. Cl. 417—315 **11 Claims**



1. In a positive displacement rotary screw compressor of the type wherien a casing is provided with a barrel portion defined by intersecting bores with coplanar axes located between axially spaced end walls and having low pressure and high pressure ports in communication with said bores at opposite ends of said barrel portion, and helical screw rotors having grooves and lands mounted for rotation within respective bores with the lands and grooves of respective rotors intermeshed, an axially extending recess is provided within the barrel portion of the casing in open communication with the bores, and a slide valve member is axially slidable in the recess with the inner face of the slide valve member being complementary to the envelope of that portion of the bores of the casing structure confronted by the opening of the recess communicating with the bore portion of the casing structure, with the valve member in sealing relation with confronting rotors, the discharge port being located within the barrel portion of the casing structure with the valve member being movable between extreme positions, in one of which, the discharge port is fully open, and the other in which, the discharge port is closed, and wherein the valve member is of sufficient length to cover the entire remaining length of the confronting portion of the rotor structure throughout the range of movement of the valve member between its extreme positions, the improvement comprising:

means for sensing the pressure of the working fluid within a closed thread closely adjacent to the end of the slide valve member closing off the discharge port to the closed thread,

means for sensing the compressor discharge pressure of the working fluid at the discharge port, and

means for controlling shifting of said slide valve member axially to equalize these pressures to prevent undercom-

pression or overcompression of the compressor working fluid within the closed thread, prior to discharge.

3,936,240

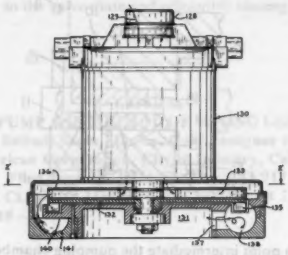
CENTRIFUGAL-VORTEX PUMP

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 25, 1974, Ser. No. 454,046

Int. Cl.² F04B *39/06;* **F04D** *17/12*

U.S. Cl. 417—368 **12 Claims**



1. A multiple path vortex pump comprising a casing and a rotor assembly in the casing having a first side and a second side; the first side of the rotor assembly having centrifugal impeller blades therealong and the second side of the rotor assembly having a plurality of vortex impeller blade elements therealong; the casing having an inlet opening therein for admitting fluid medium to the centrifugal impeller blades, a first portion forming an exhaust region for fluid discharged from the centrifugal impeller blades, a second portion forming a vortex pathway along an annular pathway for the vortex impeller blade elements, and means for dividing the vortex channel into a plurality of vortex channel part-annular sections; said casing having at least one portion for defining passage means constraining fluid to move from the exhaust region to the plurality of part-annular sections for admitting fluid medium from the centrifugal impeller blades to the part-annular sections so that substantially all of the fluid exhausted to the exhaust region is admitted to the plurality of part-annular sections, the second portion of the casing having discharge means therein through which the fluid medium previously exhausted from the centrifugal impeller blades is discharged from the vortex channel part-annular sections.

3,936,241

HOUSING SYSTEM FOR GAS TURBINES

Harro Einbeck, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurnberg, Germany

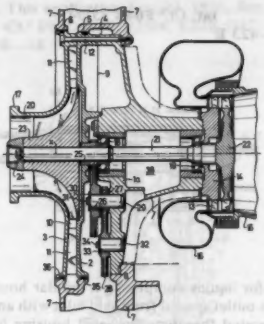
Filed May 16, 1974, Ser. No. 470,605

Claims priority, application Germany, May 17, 1973, 2324880

Int. Cl.² F04B *17/00*

U.S. Cl. 417—407 **8 Claims**

1. In combination in a gas generation housing system for gas turbines, especially vehicle gas turbines: main housing means for a gas turbine, a gas generator housing arranged at least partially in said main housing means and including an externally bell-shaped section forming a bearing housing and provided at the region of its greatest radial extension with a firmly cast on bearing wall, bearing means arranged in said bearing housing, shaft means rotatably journaled in said bearing means, a turbine wheel mounted at one end section of said shaft means for rotation therewith, a compressor wheel mounted at the other end section of said shaft means for rotation therewith, compressor housing means housing said compressor wheel and defining therewith a compressor suction chamber, said compressor housing means including a wall forming a detachable cover and together with said bearing housing defining a transmission chamber, said compressor housing means aside from said cover and said bearing housing means respectively forming individual sections successively



and detachable connected to said main housing means, said main housing means including centering means for coaxially receiving and centering said individual sections, and means for detachably connecting all of said individual sections to said main housing.

3,936,242

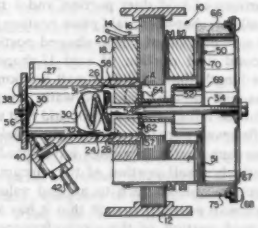
LINEAR MOTOR COOLING FAN

Martin Omer Schrock, Baltimore, and John Earl Dibbern, Jr., Street, both of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Oct. 30, 1973, Ser. No. 411,296

Int. Cl.² F04B *17/04*

U.S. Cl. 417—417 **2 Claims**



1. An electric linear air compressor comprising a housing, cooling air intake and discharge openings in said housing, a linear electric motor in said housing, piston means connected to said motor and operable therewith, compressed air intake and discharge means operable in conjunction with said piston means to deliver compressed air; the improvement which comprises a fan housing disposed adjacent said linear electric motor; a linear fan disposed in said fan housing and coupled to said motor for operation therewith; a plurality of openings in said fan housing adjacent said electric motor, said openings providing for the reciprocal flow of air therethrough upon movement of said fan; said reciprocal air flow into and out of said openings causing circulation of air about the exterior of said motor.

3,936,243

FUEL PUMP

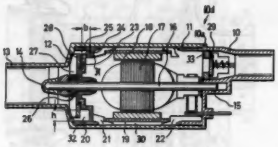
Werner Gakenholz, Bietigheim-Wurtt., Germany, assignor to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH, Germany

Filed June 24, 1974, Ser. No. 482,240

Claims priority, application Germany, July 28, 1973, 2338395

Int. Cl.² F04B *35/04*

U.S. Cl. 417—423 R 3 Claims



1. A pump for liquids comprising a tubular housing having an inlet and an outlet spaced from said inlet with an intermediate portion located therebetween, said housing having a tapered portion adjacent the inlet and connecting the inlet to said intermediate portion, an electric motor mounted concentrically in said housing and including an armature shaft and a magnetic system, an impeller mounted in said housing on said armature shaft for rotation therewith and having radially extending blades closely adjacent said tapered portion of said housing and adapted, in operation, to take up and guide the liquid toward the circumference of said impeller, and wall means forming an annular radially and longitudinally extending duct adjacent the circumference of said impeller on the side thereof facing said electric motor and shaped to guide the liquid with minimum losses of energy, said means for forming an annular duct comprise an annular duct body which is supported in said housing adjacent the side of said impeller remote from said tapered portion and including an annular plate portion concentrically arranged relative to said armature shaft and terminating in an outer edge, and a duct portion extending along and adjoining said outer edge and having a U-shaped cross-section defined by first and second longitudinally extending wall portions of said duct portion and a radially extending cross-wall therebetween, said plate portion joining the end of said first wall portion of said U-shaped portion at right angles, said second wall portion of said U-shaped portion being of greater length than said first wall portion, and said connecting cross-wall between said two walls being provided with apertures for the liquid, the length of said first shank from the end of said first wall portion to the inside of said connecting crosspiece is such that it increases in longitudinal depth over a comparatively small portion of the circumference of said annular duct body from zero to an end value, and the space of said two wall portions is such that it has a minimum value over the said portion of the circumference and then increases to a maximum value over the remaining part of said circumference.

3,936,244

FUEL INJECTION PUMPING APPARATUS

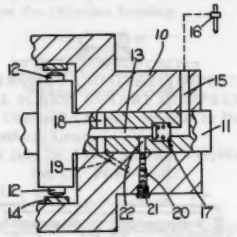
Moshe Drori, East Twickenham, England, assignor to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 396,533, Sept. 12, 1973, abandoned. This application Feb. 4, 1975, Ser. No. 546,942

Int. Cl.² F04B *19/02, 29/00, 39/00*

U.S. Cl. 417—435 4 Claims

1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a body part, a rotary distributor mounted in the body part, an outlet passage in the body part adapted for connection to an injection nozzle of an associated engine and a fuel delivery passage in the distributor member, said delivery passage communicating with the pumping chamber of an injection pump and being arranged to register with said outlet passage during delivery of fuel by said injection pump, the apparatus also incorporating a delivery valve disposed in one of said passages, said delivery valve including a spring-loaded valve element which is opened by the flow of fuel from the injection pump, a valve controlled vent passage in the body part and a vent conduit in the distributor, said vent conduit communicating with said delivery



passage at a point intermediate the pumping chamber and said delivery valve, and with the vent passage during a delivery stroke of the injection pump, the valve controlled vent passage comprising a passage having at its end adjacent the exterior of the body part a screw-threaded portion to receive a complementarily screw-threaded plug which can be loosened or removed from the passage to permit bleeding of air, the passage also defining at its end adjacent the distributor, a seating, a valve element for co-operation with said sealing and resilient means biasing the valve element into contact with the seating.

3,936,245

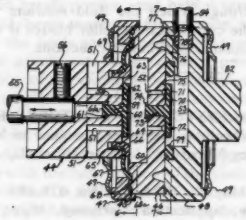
FLUID COMPRESSING APPARATUS

Adolph J. Hilgert, Mequon, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 240,718, April 3, 1972, Pat. No. 3,784,334. This application July 5, 1973, Ser. No. 376,614

Int. Cl.² F04B *39/10*

U.S. Cl. 417—550 5 Claims



1. In a fluid pumping apparatus including a piston member having a diaphragm connected thereto and forming a movable wall of a working chamber, said piston member moving into a final pumping position within the working chamber, said diaphragm being formed of a resilient material and having a preformed unstressed annular convolution of a generally U-shaped configuration immediately adjacent to the outer wall of the piston and inner and outer generally coplanar clamping walls extending from said convolution, said inner clamping wall being secured to the piston member, said working chamber including means axially clamping said outer clamping wall and having a projection aligned with said convolution and having a surface corresponding thereto and mating with and essentially filling said convolution with the piston moved inwardly to an intermediate position within the working cham-

ber prior to and in spaced relation to said final pumping position and with said convolution in the unstressed preformed state, said piston member including inlet valve openings extending generally axally of the piston and terminating in the working chamber, an inlet valve means connected to the piston member and overlying the terminal end of the inlet valve openings, said inlet valve means including a closure member resiliently urged into sealing engagement with the face of the piston member, a valve plate having a plurality of output openings and connected to said diaphragm to form a wall of said working chamber, and an outlet valve means connected to the valve plate and releasably closing said output openings.

3,936,246

MIXING PUMP AND METHOD OF MIXING USING SAME

Stuart W. Beitzel, Santa Monica, Calif., assignor to Chromalloy American Corporation, City of Industry, Calif.

Filed June 28, 1974, Ser. No. 483,917
Int. Cl.² F01C *21/00;* F04C *15/00;* F04B *23/12*
U.S. Cl. 418—1 6 Claims

1. A process for forming a liquid-gas mixture using a rotary vane pump having a stator, a rotor rotatably mounted in said stator, slot means located in said rotor for holding vanes so that such vanes can be moved relative to said rotor, vane means for use in achieving a pumping action located in said slot means, a gas inlet means leading into said stator to within the space between said stator and said rotor, a liquid inlet means for conveying a liquid into said rotor so that such liquid will operate so as to move said vane means outwardly from said rotor and outlet means for receiving a gas-liquid mixture which comprises the steps of:

rotating said rotor,

simultaneously supplying a liquid under pressure to said liquid inlet means so as to force said vane means outwardly from said rotor into contact with said stator,

drawing a gas into the space between said rotor and said stator as a consequence of the rotation of said rotor within said stator while said vane means are positioned outwardly from said rotor in contact with said stator,

allowing liquid to escape from within said rotor through said slot means into the space between said rotor and said stator in contact with gas within said space,

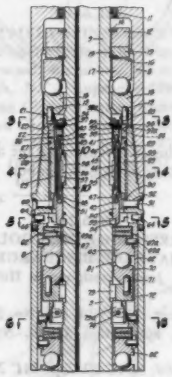
mixing said liquid and said gas as a result of turbulence within said stator between said stator and said rotor, such turbulence being caused by the movement of said gas and said liquid and the rotation of said rotor and said vane means, forcing said mixture through said outlet means as a consequence of the rotation of said rotor within said stator while said vane means are positioned in contact with said stator.

3,936,247

FLOATING FLOW RESTRICTORS FOR FLUID MOTORS

John E. Tschirky, Long Beach, and Gary Monroe Crase, Cypress, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. Nos. 388,586, Aug. 15, 1973, Pat. No. 3,879,094, and Ser. No. 433,284, Jan. 14, 1974, Pat. No. 3,912,425. This application Jan. 27, 1975, Ser. No. 544,353
Int. Cl.² F01C *1/10, 21/04;* E23B *3/12, 17/00*
U.S. Cl. 418—48 19 Claims



1. A hydraulic motor including a stator in a housing and a rotor in said stator, a shaft connected to said rotor, a fluid inlet to said stator, and a fluid outlet from said stator, a thrust bearing mounted on said shaft and housing, a fluid passageway connected to the fluid outlet from said stator through the housing, a flow restrictor positioned in said passageway between the stator outlet and said thrust bearing, said flow restrictor comprising a first sleeve mounted on said shaft, support means for said first sleeve mounted on said shaft for radial displacement of said sleeve with respect of said shaft, a second sleeve mounted on said housing adjacent to but spaced from said first sleeve.

3,936,248

CASING FOR ROTARY PISTON ENGINES OF TROCHOIDAL CONSTRUCTION

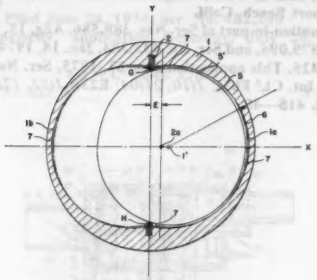
Albert Fritzsche, Markdorf, and Karl Jäger, Immenstaad, both of Germany, assignors to Dornier GmbH, Germany

Filed Apr. 1, 1974, Ser. No. 456,883
Claims priority, application Germany, May 11, 1973, 2323790
Int. Cl.² F04C *1/02*
U.S. Cl. 418—61 B 1 Claim

1. In a casing for a rotary piston engine of trochoidal construction having a piston in the shape of an epitrochoid, a casing corresponding to an outer envelope curve, and individual working chambers with radial sealing strips mounted between them,

the improvement comprising that the working chamber delimitation between the radial sealing strips constituting the casing is formed by a circular arc approaching the extent of the envelope curve, whose center is positioned on the axis of symmetry of the respective working chamber, said center of said circular arc being positioned between the point of intersection which results from the respective normal to the envelope curve at the end point of said envelope curve arc associated with the pertinent

working chamber and the axis of symmetry of the corresponding working chamber, and the center of the envelope curve radius of curvature on the axis of symmetry of the corresponding working chamber.



3,936,249

ROTARY COMPRESSOR OF OIL COOLING TYPE WITH APPROPRIATE OIL DISCHARGE CIRCUIT

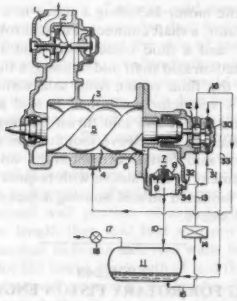
Goro Sato, Atami, Japan, assignor to Hokuetsu Kogyo Co., Ltd., Japan

Filed Sept. 24, 1974, Ser. No. 508,837

Claims priority, application Japan, Nov. 26, 1973, 48-131739

Int. Cl.[2] F01C *21/04*; F04C *29/02*; F01C *21/06*; F04C *29/04*

U.S. Cl. 418—88 1 Claim



1. In a rotary compressor of the oil cooling type comprising: an unloader, a housing including a rotor chamber therein and connected to said unloader, rotors housed within said housing, said rotor chamber having a discharge port from which an oil-air mixture is discharged under pressure, and a discharge chamber which is in communication with said discharge port, a check valve with a further port provided in said discharge chamber, discharge conduit means communicated with said discharge chamber through said check valve and said further port, a reservoir for compressed air and oil connected at an air space formed therein to said discharge pipe, and second conduit means communicated with said reservoir at the oil space therein and said rotor chamber, said discharge chamber having a second opening which is positioned at a lower portion than said further port, whereby oil is separated from the oil-air mixture and collected in said lower portion, an oil discharge pump drivably connected to one of said rotors, said oil discharge pump being connected at one side to said second opening through third conduit means and at the other side to said reservoir through fourth conduit means whereby the oil is delivered from the discharge chamber to the reservoir continuously during operation of the compressor.

3,936,250

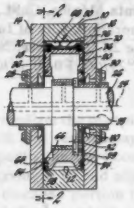
CORNER SEAL COIL SPRING ARRANGEMENT FOR ROTARY ENGINE

Jerry R. Mrlik, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 10, 1974, Ser. No. 487,173

Int. Cl.[2] F01C *19/04*, *19/08*; F04C *27/00*

U.S. Cl. 418—121 3 Claims



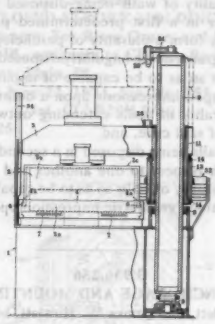
1. In a rotary machine, a housing having an inwardly facing inner peripheral wall and a pair of spaced oppositely facing inner end walls, a rotor rotatably mounted in said housing having sides opposite said end walls and a plurality of corners that remain adjacent said peripheral wall as said rotor rotates, said rotor and said housing walls cooperatively defining a plurality of chambers separated by said rotor corners that expand and contract as said rotor rotates, each said rotor corner having an apex seal slot extending thereacross facing radially outwardly toward said peripheral wall, each said rotor side at each corner having a corner seal hole immediately joining with one of said apex seal slots and facing outwardly toward one of said end walls, each said rotor side further having a side seal groove extending along the periphery of said rotor side and joining at opposite ends with two of said corner seal holes, apex seal means mounted in each said apex seal slot and extending at opposite ends into the adjoining corner seal holes, a side seal mounted in each said side seal groove and extending at opposite ends into the adjoining corner seal holes and engaging the opposite end wall, a corner seal mounted in each said corner seal hole for engaging the opposite end wall, each said corner seal having a centerline and a periphery engaged by the ends of two adjoining side seals and also having an apex seal slot receiving the adjoining apex seal means whereby the corner seal provides a sealed juncture between the adjoining apex seal means and two side seals, a leaf spring having a center portion seated on the bottom of each apex seal slot in said rotor and having end portions extending into the adjoining corner seal holes to engage and urge the apex seal means radially outward against said peripheral wall, each said corner seal having a relieved portion in the backside thereof, and each said apex seal means having a relieved portion cooperating with the relieved portion in the adjoining corner seal to provide an annular space about the adjoining spring end portion concentric with the corner seal and within the accommodating corner seal hole between the corner seal and the bottom of the accommodating corner seal hole, and a multi-coil coil spring mounted in each said annular space concentric with the adjoining corner seal for biasing the corner seal outward against the opposite end wall.

3,936,251

PRESS, NOTABLY FOR VULCANIZING TIRES

Michel Billey, Montlucon, France, assignor to Etablissements Zelant, Gazuit, Montlucon, France

Filed Mar. 11, 1975, Ser. No. 557,308
Claims priority, application France, Apr. 4, 1974, 74.11967
Int. Cl.[2] B29H 5/02
U.S. Cl. 425—38 14 Claims



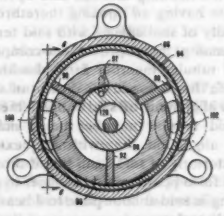
1. a press for vulcanizing tires, which comprises a frame structure, an unloading station located on one side of said frame structure, a mold comprising a lower portion supported by said frame structure and an upper portion, a cross member from which said upper mold portion is suspended, said cross member extending over said frame structure and being movable in relation thereto between a molding position in which said upper mold portion is vertically aligned with said lower mold portion and an unloading position in which said upper mold portion is vertically aligned with said unloading station, wherein said cross member is mounted at one end in overhanging relationship to a support having a vertical axis, said cross member being so arranged that it can both pivot about the vertical axis of said support and slide therealong.

3,936,252

STEAM PROPULSION SYSTEM

William A. Maher, Sepulveda, Calif., assignor to Wilma Ryan, Arlington Heights, Ill.

Division of Ser. No. 165,987, July 26, 1971, Pat. No. 3,820,335. This application June 13, 1974, Ser. No. 479,041
Int. Cl.[2] F04C 1/00
U.S. Cl. 418—173 3 Claims



1. A rotary cylinder positive displacement motor comprising:

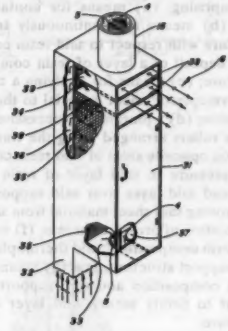
a. an outer cylinderical shell
b. an inner rotating cylinder
c. a carrier adapted to receive
d. rotor blades which slide in said carrier
e. a rotating disc to position said rotor blades
f. a motor shaft rotatably mounted on roller bearings attached to said carrier
g. ports for the introduction and release of steam adapted to cause said rotors to rotate within said outer shell
h. a thrust bearing assembly interconnecting said outer shell and said cylinder
i. a second thrust bearing assembly interconnecting said disc and said outer shell

3,936,253

APPARATUS FOR MELT-SPINNING SYNTHETIC FIBERS

William Bernard Fisher; Dong Wha Kim, both of Chester; Orin Wyatt Norwood, Richmond, all of Va.; John Walter Showers, Raleigh, N.C.; Eugene Addison Swanson, Disputanta, and Gene Clyde Weedon, Richmond, both of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 473,260, May 24, 1974. This application Dec. 10, 1974, Ser. No. 531,261
Int. Cl.[2] D01D 3/00
U.S. Cl. 425—72 S 4 Claims



1. An apparatus for the production of a synthetic multifilamentary yarn having uniform quality at a production rate of at least 50 pounds per hour, from a high-molecular weight thermoplastic polymer, selected from the group consisting of linear polyester and polyamide polymers, by melt spinning, comprising a spinning unit which comprises a spinning pump, a spinneret, and a spinning filter disposed between said pump and said spinneret, for extruding a plurality of filaments downwardly into a heating sleeve having a height of 0.5 to 2 feet, the wall of said heated sleeve being imperforate and secured to the spinneret in an air-tight manner, said heated sleeve having a baffle forming an inwardly extending flange at the end of the heated sleeve remote from the spinneret, said heating sleeve leading downwardly to a rectangular quenching chamber at least 60 inches in height, having opposite, essentially vertical inlet and outlet panels for allowing cooling air to pass through the chamber and means for regulating the stream of cooling air passing through said chamber whereby both the volumetric rate of the air steam and its general direction as it contacts the descending plurality of filaments may be regulated, the top portion of said chamber having 2 to 5 parallel baffles which form sections intended to provide guided travel of the cooling air transverse to the movement of the filaments, the outlet panel of said chamber being partially covered by an imperforate door which terminates short of the top of said chamber and presents an open passage for the air discharging from said chamber, said door in combination with said parallel baffles in the top portion of said chamber providing guided travel of the cooling air, whereby said cooling air contacts the

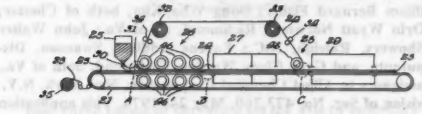
filaments transverse, countercurrent and cocurrent in progressive order of their movement through the quenching chamber.

3,936,254

APPARATUS FOR THE CONTINUOUS MANUFACTURE OF POLYMER PLATES

Teruho Sawada; Takeshi Hirayama, and Kenzo Kokubo, all of Osaka, Japan, assignors to Nippon Paint Company Ltd., Osaka, Japan

Division of Ser. No. 344,855, March 26, 1973. This application Sept. 16, 1974, Ser. No. 506,164
Int. Cl.[2] B29D 7/14
U.S. Cl. 425—89 4 Claims



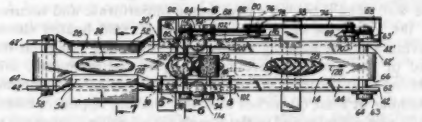
1. An apparatus for the continuous manufacture of photopolymer printing plates having a metallic support structure and a water-inclusive resin composition in adherent contact therewith comprising: (a) means for containing said resin composition; (b) means for continuously transporting said support structure with respect to said resin containing means to permit the deposit of a layer of resin composition on said support structure; (c) means for applying a continuous sheet of flexible thermoplastic sheet material to the surface of said resin composition; (d) a plurality of successive pairs of spaced apart pressure rollers arranged along the transporting means and disposed on opposite sides of said resin composition layer for applying pressure to said layer of resin composition to uniformly spread said layer over said support structure; (e) means for removing said sheet material from said layer of resin after the application of pressure thereto; (f) means for cooling said layer of resin composition, said thermoplastic sheet material and said support structure; and (g) means for drying said layer of resin composition and said support structure for a time sufficient to firmly secure said layer of resin to said support structure.

3,936,255

DOUGH EMBOSSING APPARATUS

Joseph Vito Bellacicco, Elmhurst, N.J., assignor to Bellacicco & Sons, Inc., Queens Village, N.Y.

Filed July 15, 1974, Ser. No. 488,445
Int. Cl.[2] A21C 11/04
U.S. Cl. 425—101 18 Claims



1. A dough processing apparatus for embossing wads of dough formed in predetermined masses comprising

an endless belt having an upper surface disposed in a substantially horizontal plane and being capable of movement along a longitudinal path,

power drive means operatively coupled to said endless belt for providing movement thereof,

frame means for mounting said power drive means and said endless belt,

embossing means journaled in said frame means with the longitudinal axis thereof disposed substantially transverse to said longitudinal path and operatively coupled to said power drive means for imparting a predetermined design to each of said dough masses disposed on said endless belt,

brush means journaled in said frame means and having the longitudinal axis thereof disposed substantially transverse to said longitudinal path.

12. An embossing member for use in conjunction with a dough processing apparatus, said member comprising

a cylindrical core,

a first plurality of walls extending outwardly from the periphery of said core,

said first plurality of walls being disposed with respect to one another in a first predetermined pattern so as to substantially form a plurality of parallelograms,

said parallelograms being angularly disposed with respect to one another so as to be capable of imparting a plurality of brick shaped impressions upon a deformable mass,

a second plurality of walls extending outwardly from the periphery of said core, and

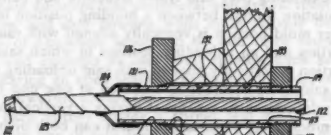
said second walls being disposed in a second predetermined pattern with respect to one another and with respect to said first plurality of walls so as to be capable of imparting a predetermined geometric impression upon said deformable mass.

3,936,256

TENDON ANCHORAGE AND MOUNTING MEANS

George H. Howlett, and James W. Howlett, both of Oakland, Calif., assignors to Conenco International Limited, Toronto, Canada

Continuation-in-part of Ser. No. 816,583, April 16, 1969, Pat. No. 3,605,361. This application Mar. 1, 1971, Ser. No. 119,710. The portion of the term of this patent subsequent to Sept. 20, 1988, has been disclaimed.
Int. Cl.[2] B28B 23/04
U.S. Cl. 425—111 3 Claims



1. In an assembly for use in forming an anchorage for a reinforcing tendon recessed in a concrete member, said assembly including a form board formed with an opening therethrough, a tendon mounted through said opening and extending inwardly of said form board, a spacer having an opening therethrough and being mounted inwardly of said form board with said tendon extending through said opening, and a tendon anchor plate having an opening therethrough and being mounted inwardly of said spacer with said tendon extending through said opening, the improvement comprising:

an elongated tubular member formed with an axially extending bore dimensioned for receipt of said tendon and for coaxial alignment of said tubular member with said tendon, said tubular member being mounted on said tendon in alignment therewith and extending from a position exteriorly of said form board through said openings in said form board and said spacer to project through said opening in said anchor plate to a bearing surface side of said anchor plate;

first securement means formed to and releasably joining said tubular member to said anchor plate with said tubular member in axial alignment with said opening in said anchor plate; and

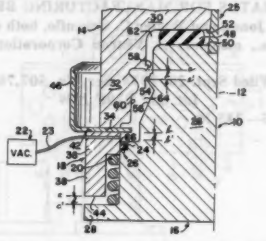
second securement means mounted to said tubular member exteriorly of said form board and formed to and engaging said form board for application of a clamping force thereto, at least one of said first and second securement means further being selectively axially adjustable to effect tensioning of said tubular member between said first and second securement means to clamp said anchor plate against said spacer means and said spacer means against said form board.

3,936,257

CLOSED STROKE MOLDING

Keith W. Christiansen, Fox River Grove, and Kare Andersen, Elgin, both of Ill., assignors to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed June 22, 1971, Ser. No. 155,469
Int. Cl.² B29H 9/10
U.S. Cl. 425—125 **3 Claims**



1. A mold assembly for forming an insert molded article comprised of a relatively rigid insert element and a flexible body portion, said mold assembly comprising a first, fixed mold part having surfaces thereon defining at least a portion of a molding cavity, and second and third relatively movable mold parts, at least one of which includes surfaces thereon defining the remainder of said molding cavity, insert-receiving surfaces forming a part respectively of each of said second and third mold parts, means confining said second and third mold parts to a predetermined extent of movement along a given axis relative to said first part, spring means providing resistance to movement of said third part during one portion of said predetermined movement extent when said second and third mold parts move toward said fixed mold part, means for moving said second part away from said third part along said axis to open said second and third parts and to permit positioning of an insert element between said insert-receiving surfaces, and means for moving said second and third parts along said axis against the resistance of said spring while said insert is received between said second and third parts against the resistance of said spring.

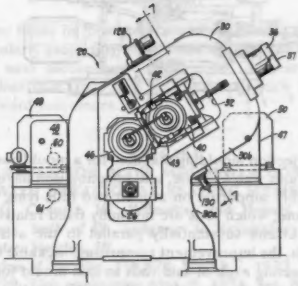
3,936,258

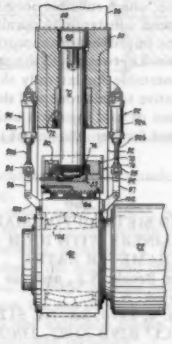
CALENDER

Charles G. Lake, Akron, Ohio, assignor to Intercole Automation, Inc., Cleveland, Ohio

Filed Jan. 30, 1974, Ser. No. 437,771
Int. Cl.² B29C 15/00; B29D 7/14; B29H 3/00
U.S. Cl. 425—135 **7 Claims**

1. A calender comprising:
first and second cooperating rolls,
means including a frame and frame supported bearing boxes supporting the rolls at each end for rotation and supporting the first roll for movement toward and away from the second,
hydraulic means for changing the spacing between said rolls and for applying pressure to the first roll and thence to material between the rolls,
said hydraulic means comprising a double acting fluid cylinder and reciprocable piston at opposite ends of said first roll acting between the bearing boxes of said roll and said frame,
each said cylinder and piston having a stroke as great as the total distance through which said first roll is movable,
fluid actuators connected between said frame and the bearing boxes of the movable first roll to bias the first roll against said hydraulic means,





means including two linear voltage differential transformers carried on each bearing box of one of said first and second cooperating rolls acting between the bearing boxes of said first and second rolls, sensitive to changes in the bearing box positions of said first and second rolls relative to each other for providing a signal indicative of roll spacing, the two transformers on each box being located on opposite sides of and equidistant from the axis of the carrying roll in a direction that extends at right angles to the direction of relative movement between the rolls, and
means for actuating said hydraulic means in response to said signal, to adjust the roll spacing.

3,936,259

INJECTION MOULDING MACHINE

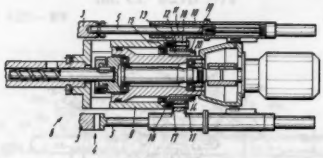
Heinz Höfer, Flammersfelder Str. 33, 5461 Schoneberg; Peter Scheid, Hangweg, 5460 Linz, Rhine, and Ernst Wilwerscheid, Hoelstr. 26, 5400 Koblenz, Rhine, all of Germany

Filed Dec. 18, 1973, Ser. No. 425,877

Claims priority, application Germany, Jan. 17, 1973, 2302167

Int. Cl.² B29C *1/00*; B29G *3/00*

U.S. Cl. 425—242 R 21 Claims



1. In an injection moulding machine for a mould and having an injection unit with a nozzle, said injection unit having guide sleeves slidably supported on at least two rods lying within a common plane, which rods are normally fixed relative to the mould and extend substantially parallel to the axis of said injection unit, the improvement comprising: lockable coupling means connecting each of said rods to said mould for pivotal adjusting movement of said injection unit relative to said mould above a pivot axis generally perpendicular to said rods and for lateral adjusting displacement of said injection unit relative to said mould parallel to said pivot axis when unlocked, and for rigidly securing said injection unit relative to said mould after adjustment when locked.

8. In an injection moulding machine for a mould and having an injection unit with a nozzle, said injection unit having guide sleeves slidably supported on at least two rods generally lying within a common plane, which rods are normally fixed relative to the mould and extend substantially parallel to the axis of said injection unit, the improvement comprising: a rotatable eccentric means disposed between said injection unit and said guide sleeves to be rotatable for laterally shifting the axis of said injection unit relative to said rods and sleeves; and means for locking the position of said injection unit relative to said rods and sleeves against further adjustment to rigidly fix such lateral adjustment.

3,936,260

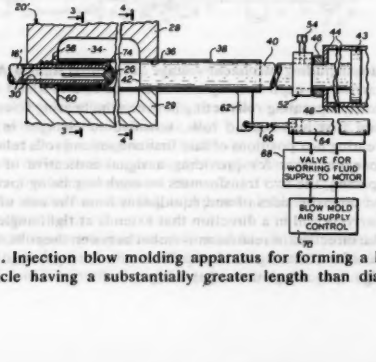
APPARATUS AND METHOD FOR MAKING BLOW MOLDED CONTAINERS WITH HIGH LENGTH TO DIAMETER RATIO

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Filed Oct. 4, 1974, Ser. No. 512,294

Int. Cl.² B29D *23/02*, *23/03*

U.S. Cl. 425—242 B 10 Claims



1. Injection blow molding apparatus for forming a hollow article having a substantially greater length than diameter including a core rod, an injection station having an injection mold in which a parison is injected over the core rod, a blowing station, means to transfer said core rod and parison from said injection station to said blowing station, said blowing station including a mold having a cavity therein and into which the core rod projects for a blowing operation, the cavity being substantially longer than the core rod and parison in the direction in which the core rod extends into the cavity, and means for increasing the length to diameter ratio to which the parison can be blown including a tube that extends into the mold cavity from the end of the cavity opposite to that at which the core rod extends into the cavity, the core rod and tube being in substantial alignment with one another and the tube having a diameter greater than that of the core rod and with clearance for the parison to extend into the tube, means for blowing the parison to expand it lengthwise in the tube, and means for progressively withdrawing the tube from the blow mold cavity during blowing of the parison.

3,936,261

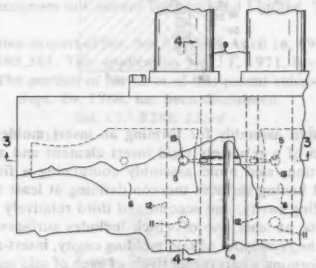
APPARATUS FOR MANUFACTURING BRUSHES

Kenneth B. Jones, and Walter C. Gorenflo, both of Easthampton, Mass., assignors to Vistron Corporation, Cleveland, Ohio

Filed Sept. 20, 1974, Ser. No. 507,768

Int. Cl.² B29F *1/04*

U.S. Cl. 425—245 R 3 Claims



1. An apparatus comprising a mold which provides a mold cavity, a cylindrical gate section communicating with said mold cavity, said gate section being equipped with a guide pin and a slidably movable punch pin which is in the form of a solid rod which acts as a piston to force the material present in the gate section into the mold and conforms with the internal shape of the gate section and its end being flush with said mold cavity.

3,936,262

MULTI-ORIFICE INJECTOR NOZZLE FOR INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl Strasse 32, 7291 Lossburg, Germany

Filed May 15, 1974, Ser. No. 470,283

Claims priority, application Germany, July 28, 1973, 2338458

Int. Cl.² B29F *1/03*

U.S. Cl. 425—248 11 Claims

1. In an injection molding machine having an injection mold with a plurality of injection ports for the simultaneous injection of plastic material therethrough, and an injection unit with a plastification cylinder for supplying plastified material to the injection mold, a multi-orifice injector nozzle attachment for the injection unit adapted, for example, for the processing of clear, temperature-sensitive plastic materials, the attachment comprising in combination:

a nozzle head in the form of a split block constituted by two block halves joined together along flat clamping faces defining a central separation plane;

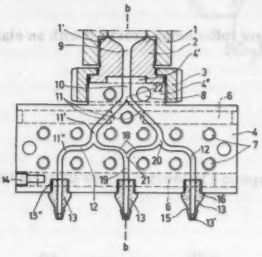
a system of flow channels extending through the nozzle head in alignment with its separation plane, so that the channel walls are constituted jointly by the contiguous block halves, the channel system including:

a main channel entering the nozzle head from one side thereof;

three parallel smaller injection channels leaving the nozzle head on the side opposite the main channel;

a primary channel bifurcation having an entry portion communicating with the main channel and two exit portions opening into two intermediate channels;

two transversely spaced secondary channel bifurcations, each having an entry portion communicating with one of said intermediate channels and two exit portions of which the outer one leads to the respective outer injection channel and the inner one coverges with the inner exit portion of the other secondary bifurcation; and



a central channel junction having two entry portions communicating with said converging inner exit portions and an exit portion opening into the central injection channel; and wherein

the entry and exit portions of the several channel bifurcations and of the channel junction have curved, smoothly continuing wall outlines and gradual diameter transitions, free of recesses, for an even flow of plastic material therethrough; the nozzle attachment further comprising:

means for removably connecting the nozzle head to the discharge end of the plastification cylinder, so that its main channel sealingly communicates with said cylinder; and

means for clamping together the two block halves of the nozzle head so as to establish hermetic contact between their clamping surfaces along the outline of said channel system.

3,936,263

APPARATUS IMPROVEMENTS IN A ROTARY BLOW MOLDING MACHINE

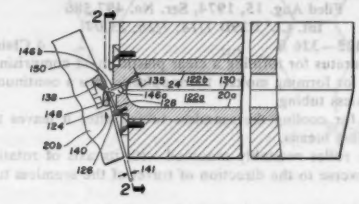
Michael J. Avery, Forrestville, and Lawrence A. Martino, East Hartford, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 480,605, June 19, 1974. This application Apr. 9, 1975, Ser. No. 566,255

Int. Cl.² B29D *23/03*

U.S. Cl. 425—296 **5 Claims**

1. In a rotary machine for blow molding hollow articles from an extruding tube of thermoplastic material which includes a wheel arranged for rotation and having a plurality of arms, each arm carrying a partible mold comprising an inner section and an outer section radially movable along said arm, cam means generally surrounding said wheel including a mold-opening cam portion, means associated with each outer mold section for periodically engaging said mold-opening portion during rotation of said wheel and spring means between the axis of said wheel and each inner mold section for urging each inner section incrementally outwardly as said means associated with each outer mold section traverses the initial section of the mold-opening cam portion, the improvement in said machine which comprises, in combination,



a wiper blade on the back face of each inner mold section angularly projecting toward and abutting the front face of the next succeeding inner section to shear the plastic against said front face as a result of such incremental outward movement.

3,936,264

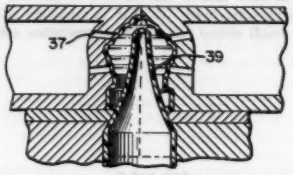
APPARATUS FOR BLOW MOLDING A CONTAINER WITH BREACHABLE SEALING MEMBERS

Walter G. Cornett, III, Wilmette, and Donald G. Gaspar, Burbank, both of Ill., assignors to Respiratory Care, Inc., Arlington Heights, Ill.

Division of Ser. No. 338,878, March 7, 1973, Pat. No. 3,851,029. This application Mar. 6, 1974, Ser. No. 448,684

Int. Cl.² B29D *23/03*

U.S. Cl. 425—326 B **13 Claims**



1. An apparatus for molding and sealing a container comprising:

an extrusion head adapted to extrude a length of thermoplastic tubing;

at least one sectional mold assembly which is arranged and constructed to enclose said length of extruded tubing;

said mold assembly including a lower sectional mold adapted to shape the body and close the bottom of the container and to shape at least two neck-like members extending from the top of such container;

means to sever the extruded tubing at a plane displaced above said neck-like members;

said mold assembly being so constructed and arranged, and including means above said lower sectional mold adapted to pinch closed all but one of the top portions of the formed neck-like members to form a breachable sealing membrane the major plane of which is disposed generally transverse to a longitudinal axis of said neck-like member;

fluid pressure applying nozzle adapted to be introduced into the remaining open said neck-like member to supply fluid under pressure to expand said tubing in said lower sectional mold into contact with at least a part of said lower sectional mold to form a body of said container; and

said mold assembly including an upper sectional mold arranged and constructed to shape that portion of the extruded tubing above said neck-like member into a pinched-off closed cap above said breachable sealing membrane.

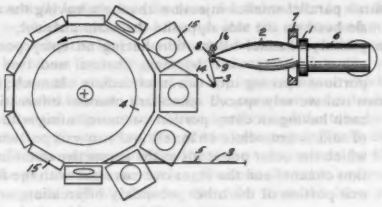
3,936,265

MANUFACTURING CLEAR PLASTIC LIDS

James A. McDevitt, Kalamazoo, Mich., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Aug. 15, 1974, Ser. No. 497,586
Int. Cl.[2] B29D 7/14, 7/26, 23/04
U.S. Cl. 425—326 R 4 Claims

1. Apparatus for forming a clear plastic sheet comprising:
means for forming molten thermoplastic into a continuous seamless tubing,
means for cooling the seamless tubing after it leaves the forming means,
a draw roller rotatably mounted with its axis of rotation transverse to the direction of travel of the seamless tubing,
the draw roller being formed of uncoated metal,
the draw roller having internal means for cooling the surface thereof, and
a pressure roller for pressing the seamless tubing against the surface of the draw roller and for pressing the walls of the tubing together along their extent between the draw roller and the pressure roller to fuse the tubing into a continuous weld and thereby provide a single clear sheet of plastic material,



the pressure roller being provided with an elastomeric coating.

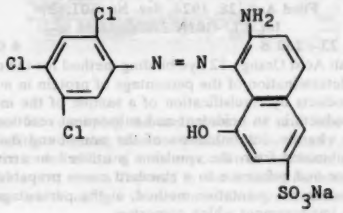
3,936,266

TRIHALO MONOAZO DYESTUFFS

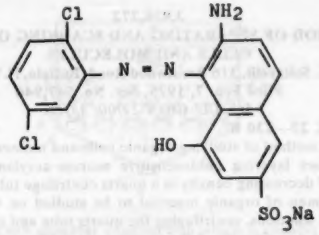
John H. McLeod, Tonawanda, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,688
Int. Cl.[2] C09B 27/00, 45/48; C07C 107/08; D06P 1/06
U.S. Cl. 8—26 2 Claims

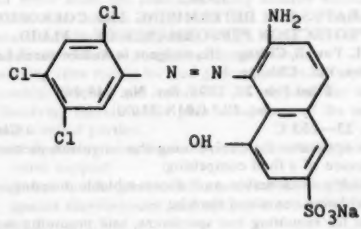
1. As a dye composition, a mixture of from about twenty to 80 weight percent of a compound having the formula



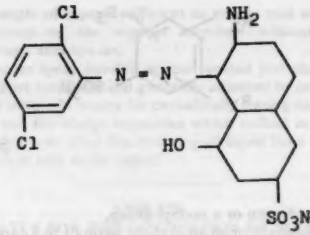
and from about 80 to 20 weight percent of a compound having the formula



2. As a dye composition, a mixture of about 20 weight percent of a compound having the formula



and about 80 weight percent of a compound having the formula



3,936,267

FLAMEPROOFING WOOL TEXTILES

William L. Wasley, Berkeley, and Allen G. Pittman, El Cerrito, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 554,055
Int. Cl.[2] D06M 3/02
U.S. Cl. 8—128 R 5 Claims

1. As an article of manufacture, a woolen-containing textile carrying a deposit of N,N′,N″-triallylphosphoramide which has been reacted in situ on the textile with bromine, and wherein the amounts of N,N′,N″-triallylphosphoramide and bromine are sufficient to render the textile flame resistant.

3,936,268

METHOD OF REDUCING BARRÉ IN SYNTHETIC POLYMIDE TEXTILES DYED WITH ACID DYES

John G. Papalos, Ledgewood, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Nov. 7, 1974, Ser. No. 521,548
Int. Cl.[2] D06P 1/84
U.S. Cl. 8—173 5 Claims

1. In a process of dyeing a nylon textile with an acid dye, the improvement which comprises:

dyeing the nylon textile in the presence of a barre-reducing quantity of a combination of anionic surfactants consisting essentially of

A. A dye-leveling alkyl sulfonate, and

B. a dye-leveling alkyl aryl sulfonate,

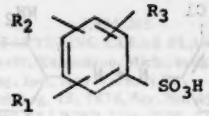
to obtain a dyed nylon textile having less barre than if similarly dyed in the presence of an equivalent amount of of either (A) or (B) alone;

the quantity of the combination of the anionic surfactants being about 0.25 to 4.0 parts by weight per 100 parts by weight of the nylon textile;

the weight ratio of the alkyl sulfonate to the alkyl aryl sulfonate being within the range of 1:9 to 9:1;

the alkyl sulfonate being a sodium, potassium, ammonium or water-soluble amine salt of an alkyl sulfonic acid having 8 to 20 carbon atoms; and

the alkyl aryl sulfonate being a sodium, potassium, ammonium, or water-soluble amine salt of an alkyl aryl sulfonic acid having the general formula:



where,

R_1 is hydrogen or a methyl group,

R_2 is hydrogen or an alkyl group having 1 to 4 carbon atoms. and

R_3 is an alkyl group having 8 to 20 carbon atoms.

3,936,269

METHOD OF COLD STERILIZATION USING FROZEN DIMETHYL DICARBONATE

Peter D. Bayne, Shorewood, Wis., assignor to Logica International Corporation, Milwaukee, Wis.

Filed Nov. 25, 1974, Ser. No. 526,529
Int. Cl.² A23B 7/14; A23L 3/34; A61L 13/04; B65B 55/22
U.S. Cl. 21—58 13 Claims

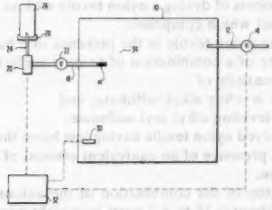
1. A method of sterilizing a perishable material, comprising the steps of heating frozen dimethyl dicarbonate to a temperature sufficient to liquify the dimethyl dicarbonate while maintaining the dimethyl dicarbonate under an atmosphere of a dry inert gas, admixing the liquified dimethyl dicarbonate with a perishable material, immediately thereafter subjecting the perishable material to a temperature in the range of 25° to 50°C to increase the antimicrobial activity of the dimethyl dicarbonate, and thereafter cooling the material to room temperature.

3,936,270

PORTABLE GAS STERILIZER SYSTEM

Donald Albert Gunther, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed June 13, 1972, Ser. No. 262,313
Int. Cl.² A61L 3/00, 3/02, 13/00; B05B 7/00
U.S. Cl. 21—91 10 Claims



1. Portable gas sterilizer system comprising

means defining a sterilizing chamber capable of holding articles for gas sterilization and gas under pressure,

atomizing means communicating with such sterilizing chamber to introduce humidifying composition into such chamber in droplet form,

means for supplying humidifying composition to such atomizing means at a pressure above that within the sterilizing chamber,

means to control such humidifying composition supplying means to obtain in such sterilizing chamber a predetermined degree of humidification for coaction in the sterilizing reaction, and

means to introduce sterilizing gas into the sterilizing chamber subsequent to the introduction of humidifying composition.

3,936,271

METHOD FOR PROTEIN ANALYSIS

Simon Statter, Playa Del Rey, Calif., assignor to The Baltimore Spice Company, Baltimore, Md.

Filed Aug. 28, 1974, Ser. No. 501,427
Int. Cl.² G01N 21/20, 33/16
U.S. Cl. 23—230 B 6 Claims

1. In an Acid Orange 12 dye binding method for the colorimetric determination of the percentage of protein in meat or meat products by emulsification of a sample of the meat or meat products in an acidulant and subsequent reaction with the dye wherein determination of the non-bound dye in a filtrate obtained from the emulsion is utilized to arrive, by difference and reference to a standard curve prepared by a non-colorimetric quantative method, at the percentage protein, the improvement which comprises:

a. emulsifying the meat and meat products under conditions wherein the temperature of the emulsified-acidified sample emulsion is at least about 40°C; and

b. reacting the sample emulsion with a solution of the dye before the temperature drops below about 40°C and allowing from about 5 minutes to about 20 minutes for the dye binding reaction.

3,936,272

METHOD OF SEPARATING AND SCANNING ORGANIC CELLS AND MOLECULES

Cora G. Saltarelli, 316 Brentwood Road, Buffalo, N.Y. 14226

Filed Feb. 7, 1975, Ser. No. 547,946
Int. Cl.² G01N 21/00, 33/16
U.S. Cl. 23—230 B 14 Claims

1. A method of studying organic cells and molecules which comprises layering photosensitive sucrose-acrylamide solutions of decreasing density in a quartz centrifuge tube, placing a specimen of organic material to be studied on top of the layered solutions, centrifuging the quartz tube and contents to separate constituents of the specimen into the various layers of the solution, exposing the quartz tube and contents to light until the solution is solidified, scanning the resulting gel with ultraviolet light to obtain patterns formed by bands of molecules or cells from the sample that are immobilized in the gel, and recording the bands which form patterns for comparative study.

3,936,273

APPARATUS FOR DETERMINING THE CORROSION PROTECTION PERFORMANCE OF A FLUID

Donald L. Powell, Chicago, Ill., assignor to Autoresearch Laboratories, Inc., Chicago, Ill.

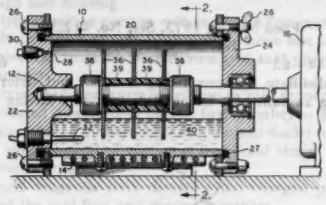
Filed Feb. 25, 1974, Ser. No. 445,468
Int. Cl.² G01N 31/00
U.S. Cl. 23—253 C 4 Claims

1. An apparatus for determining the corrosion protection performance of a fluid comprising:

a sealably encloseable and disassemblable housing, said fluid being contained therein;

means for mounting test specimens, said mounting means including a shaft, means for axially spacing a plurality of test specimens on said shaft and collar means which engage said shaft and maintain said specimens in fixed position thereon, said mounting means disposed within said housing and in spaced relation with the bottom thereof such that said test specimens may be partially immersed in the liquid phase of said fluid;

means for rotating said mounting means with said specimens mounted thereon;



means for regulating the temperature of said fluid and including a heating element positioned externally of, adjacent to and abutting a lower portion of said housing; and

sealable port means disposed in said housing for introducing into said housing a corrosion initiating substance.

3,936,274

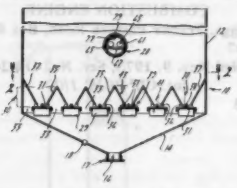
SALT DISSOLVER CONSTRUCTION

Melvin E. Leverenz, St. Clair, and Robert L. Vanderscors, Marysville, both of Mich., assignors to Diamond Crystal Salt Company, St. Clair, Mich.

Filed Feb. 14, 1975, Ser. No. 549,772

Int. Cl.[2] B01D *11/02*; B01F *1/00*; C01D *3/08*

U.S. Cl. 23—270 R **19 Claims**



1. A new salt dissolver construction which is capable of self cleaning relative to sludge-impurities formed therein during dissolving, said construction comprising:

a tank for holding the salt therein,

a generally conical bottom portion on said tank,

a drain outlet near the lowermost part of the conical bottom,

a water inlet near the lowermost portion of the conical bottom,

a brine outlet means for removing dissolved salt in the form of brine from the tank and being located substantially above the bottom of the tank but below a liquid level maintained within said tank, which liquid level in turn is maintained below a salt level in said tank,

dissolving zone means located generally near the top of said conical portion and operative to support the salt for dissolving therein while preventing flow of the salt into said conical portion,

said dissolving zone means including, a plurality of transverse support

member means positioned crosswise in the tank with spaces therebetween and operative to support the salt in the tank,

a plurality of umbrella like means positioned over and overlapping said spaces and additionally being operative to support the salt in the tank and to prevent the salt from passing downwardly through said spaces,

said overlapping being such that salt which falls downwardly over said umbrella means will pile up on said support members to form salt piles thereon which have an angle of repose sufficient to enable said salt to be retained on the support members without falling through said spaces;

and water spray conduit means located just above said support members and generally adjacent to and below said umbrella means for periodically rinsing and cleaning out the sludge-impurities which collect in the dissolving zone after first draining all liquid from the tank through said drain outlet.

3,936,275

APPARATUS FOR THE COMBUSTION OF SULPHUR

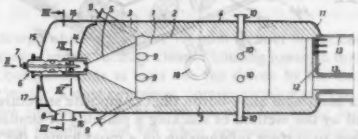
Jean-Pierre Perret, Tarnos, and Bruno Vidon, Suresnes, both of France, assignors to Societe Anonyme: Pechiney Ugine Kuhlmann, Paris, France

Division of Ser. No. 232,672, March 8, 1972, Pat. No. 3,879,530. This application Oct. 25, 1973, Ser. No. 409,622

Claims priority, application France, Mar. 10, 1971, 71.08343

Int. Cl.[2] B01J *1/00*; C01B *17/54*; F23D *11/40*

U.S. Cl. 23—278 **11 Claims**



1. An apparatus for the combustion of liquid sulphur, comprising a tubular combustion chamber having an upstream end wall having at least one conical wall portion, said conical wall portion having an entrance port the entrance port being at the apex of the conical wall portion, the cross sectional area of the conical wall portion enlarging as the wall portion approaches the combustion chamber, an injector means for said at least one conical wall portion for injecting liquid sulphur and primary combustion-supporting gas into the apex of the conical wall portion and toward the interior of the combustion chamber, each of said injector means including a tube, means for introducing primary combustion-supporting gas into said tube, a spray head disposed substantially coaxially in the tube for spraying liquid sulphur toward the entrance port, means for delivering liquid sulphur to the spray head, means in the tube upstream of the spray head for setting the primary combustion-supporting gas in rotational motion therein, and a constricting member partially closing off the end of the tube adjacent to the apex of the conical wall portion, and first means for introducing a dilution and cooling gas into the combustion chamber along the lateral walls thereof and downstream of the end wall in the direction of the flow of gaseous mixture therein.

3,936,276

PROCESS FOR PRODUCING AMETHYST CRYSTAL

Vladimir Sergeevich Balitsky, ulitsa Lenina, 12, kv. 39; Lev Nikolaevich Khetchikov, ulitsa Lenina, 12, kv. 13; Valentina Petrovna Orlova, ulitsa Krasnoi Molodezhi, 4, kv. 47, and Ljudmila Vasilievna Balitskaya, ulitsa Lenina, 12, kv. 39, all of Vladimirskaya oblast, Alexandrov, U.S.S.R.

Filed Dec. 6, 1973, Ser. No. 422,162

Int. Cl. B01j *17/04*; C01b *33/12*; B01j *17/36*

U.S. Cl. 23—301 R **7 Claims**

1. A process for producing amethyst crystals which comprises: introducing into a high-pressure autoclave a silica charge, crystalline quartz seed plates oriented parallel to pinacoid crystallographic planes {0001} or to planes inclined to said pinacoid planes at an angle up to 15° and an aqueous solution of ammonium fluoride with a concentration of from 5 to 30% by weight and containing iron in the form of its oxydic and hydroxydic compounds in an amount of from 5 to

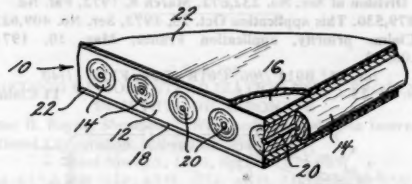
30 g/l of the solution; growing colourless quartz crystals on the seed plates in the autoclave at a crystallization temperature within the range of from 150° to 500°C under a pressure of from 10 to 1,200 kg/cm² and at a crystal growth rate of from 0.05 to 1.5 mm/day; and exposing the resulting colourless quartz crystals to an ionizing radiation.

3,936,277

ALUMINUM ALLOY-BORON FIBER COMPOSITE

William M. Jakway, Creve Coeur, and Ronald B. Kollmansberger, Florissant, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 9, 1970, Ser. No. 26,966
Int. Cl.² B32B *15/14, 35/20*
U.S. Cl. 29—191.6 3 Claims



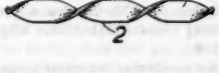
1. An aluminum alloy-boron fiber composite structure constructed by the method of stacking a plurality of similar foils in surface-to-surface relationship on a mold having the shape of the desired composite structure to be formed, each of said foils including a sheet of relatively ductile aluminum having a plurality of boron fibers distributed in a layer throughout, and each of said aluminum sheets having a coating on at least one surface thereof of copper capable of forming a liquid eutectic with the aluminum of the foil and of diffusing relatively uniformly throughout the aluminum without producing melting of any material, said foils being stacked on the mold so that at least one layer of said coating material is between each pair of adjacent foils in the stack, said composite structure being formed by subjecting said stacked foils under pressure to a predetermined temperature sufficient to form a liquid eutectic at the interfaces between the aluminum sheets and the coatings of material thereon, said predetermined temperature being greater than the eutectic temperature but less than the melting temperatures of the foils and the coatings thereon, said eutectic temperature being maintained for a sufficient time for the copper in the coating to diffuse substantially uniformly throughout the foil so as to lose its identity as a distinct coating and to integrally unite adjacent foils.

3,936,278

REINFORCING ELEMENTS

Joris Moens, Kortrijk, Belgium, assignor to Trefileries Leon Bekaert, P.V.B.A., Zwevegem, Belgium

Filed Aug. 26, 1968, Ser. No. 755,312
Claims priority, application United Kingdom, Aug. 29, 1967, 39540/67
Int. Cl. B21b *15/02*
U.S. Cl. 29—193 6 Claims



1. A tensile reinforcing element for molded or laminated articles consisting of a metal ribbon of rectangular cross section uniformly twisted into a helix along the longitudinal centerline of said ribbon, and a plurality of flattened areas uniformly spaced on at least one edge of said helically twisted ribbon along the length of said ribbon so as to deform the otherwise helically curved edge of said ribbon.

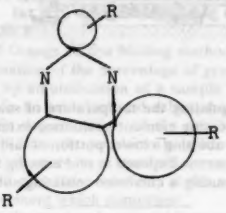
3,936,279

HEXAHYDROPYRIMIDINES AS FUEL ADDITIVES

Bernardus A. Oude Alink, and Ronald P. Hutton, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 2, 1973, Ser. No. 412,300
Int. Cl.² C10L *1/16*
U.S. Cl. 44—63 6 Claims

1. A distillate fuel containing a minor but deterioration inhibiting amount of a hexahydropyrimidine having the formula



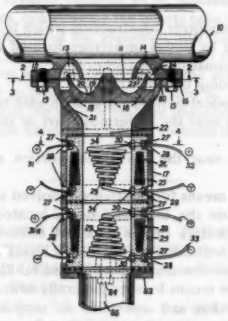
where each of the circles represents a cycloalkylene structure having from 5 to 7 carbon atoms and where the R's are hydrogen alkyl, cycloalkyl, alkaryl or aralkyl.

3,936,280

TREATMENT AND APPARATUS FOR SEPARATION OF COMBUSTION BY-PRODUCTS FROM AN INTERNAL COMBUSTION ENGINE

George L. Briggs, Frazier Pasture Road, Box 864, Ogunquit, Maine 03907

Filed Nov. 9, 1973, Ser. No. 414,243
Int. Cl.² B03C *1/00*
U.S. Cl. 55—3 7 Claims



1. The method of treating and removing combustion by-products in an effluvium from an internal combustion engine in a housing having means for generating at least one magnetic field within said housing and a first member for removing one or more negative electrons from atoms of said combustion by-products positioned within the housing in said at least one magnetic field and a second member positioned within said magnetic field downstream from said first member for collecting ionized nuclei resulting from the said removal of electrons from said atoms which comprises the steps of:

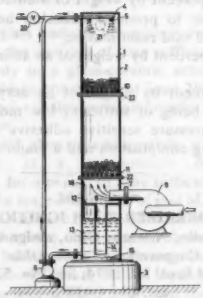
a. supplying electric current to said means to generate one magnetic field within said housing,
b. passing combustion by-products of said effluvium through said housing,
c. supplying positive current voltage to said first member to give it a positive charge to thereby remove one or more negative electrons from said atoms of said combustion by-products,
d. supplying negative current voltage to said second member located downstream of said first member to give it a negative charge to thereby collect ionized nuclei resulting from said removal of electrons from said atoms by said first member, and
e. the said magnetic field directing the charged particles toward the said first and second members.

3,936,281

METHOD AND APPARATUS FOR DEODORIZING WASTE GASES

Hans Kurmeier, Hamburg, Germany, assignor to Sudoldenburger Tierfrischmehl-Anlagengesellschaft, Nordlohne, Germany

Filed Mar. 27, 1974, Ser. No. 455,247
Claims priority, application Germany, Mar. 30, 1973, 2315911
Int. Cl.² B01D 47/14
U.S. Cl. 55—71 **6 Claims**



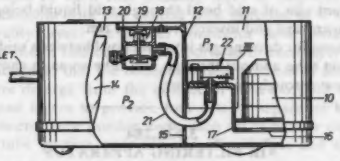
1. In the deodorizing of waste gas containing foul-smelling constituents that are chemically reactive with an aqueous acid formed by desolving an acid-forming gas in water, the method including the steps of:
moving the waste gas upwardly through a loose bed of granular material supported by a grate in a vessel, the bed providing minimal flow resistance to the moving waste gas,
spraying downwardly in the vessel an aqueous suspension of a powdered alkaline earth metal carbonate, the aqueous carbonate suspension trickling downwardly through the bed of granular material in counter-current flow to the simultaneous upward flow of waste gas through the bed and the carbonate suspension providing a large reaction surface, and
continuously mixing the acid-forming gas with the aqueous carbonate suspension prior to trickling the latter through the granular material bed.

3,936,282

VACUUM CLEANER AND TEMPERATURE-RESPONSIVE MOTOR COOLING DEVICE

Ivar Asplund, Solna, and Karl Arvid Henning Waara, Stockholm, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 27, 1975, Ser. No. 553,540
Claims priority, application Sweden, Mar. 1, 1974, 7402728
Int. Cl.² B01D 46/02
U.S. Cl. 55—217 **6 Claims**



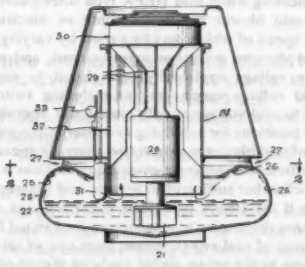
1. A temperature-responsive vacuum cleaner motor cooling device comprising a vacuum cleaner housing having a first and second compartments at least one fan driven by the vacuum cleaner motor, a dust container, communicating with an inlet the latter together with said motor and fan being located within said housing, said fan when operating functioning to transport air through said compartments while the dust is separated out in said dust container, a temperature sensing means for and adjacent said motor, a valve having a valve body normally covering an opening in said housing and comprising a chamber provided with a diaphragm, one part of said chamber on one side of said diaphragm having an opening communicating with said first compartment in a first space being located between said dust container and the suction side of said fan, an air conduit connecting said one part of said chamber on said one side of the diaphragm to said second compartment downstream of the fan and having a higher pressure and housing said motor, and a blocking means associated with said air conduit and said temperature responsive means being acted upon by said temperature sensing means when the motor temperature is too high to open said valve and thereby establish communication between the atmosphere and said first space and said motor whereby cooling air is permitted to flow about said motor.

3,936,283

COMPACT GAS PURIFIER

Frank Solis, 4283 Tujunga Ave., North Hollywood, Calif. 91604

Filed Sept. 30, 1974, Ser. No. 510,760
Int. Cl.² B01D 47/06
U.S. Cl. 55—230 **6 Claims**



1. An improved gas purifier comprising:

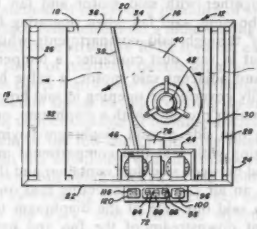
a A bowl with a reentrant outer rim, said rim pointing in and down toward the central region of said bowl
b A liquid contained in said bowl
c A rotor in the center of said bowl
d Means for spinning said rotor with such force that said liquid in said bowl is carried outward, up the wall of said bowl, around said reentrant rim and is hurled back down toward the central region of said bowl to be recycled,
e A hollow tube like structure opening into said central region of said bowl through which gas may flow out of said central region of said bowl allowing additional gas to flow into said central region of said bowl past said reentrant rim of said bowl through said liquid being hurled downward and inward from said rim,
f Means for drawing gas into said bowl between said rim and said tube and out through said tube so as to cause gas to flow through said purifier.

3,936,284

AIR FILTERING APPARATUS

Donald G. Mason, Park Ridge, Ill., assignor to Mason Engineering and Designing Corporation, Rosemont, Ill.

Filed Aug. 16, 1974, Ser. No. 497,842
Int. Cl.² B01D *46/10*
U.S. Cl. 55—274 **8 Claims**



1. An air filtering apparatus comprising a chamber having an inlet and an outlet, a prefilter panel disposed across said chamber inlet, a HEPA type filter panel disposed across said chamber outlet, dividing means intermediate said prefilter panel and said HEPA type filter panel for dividing said chamber into adjacent first and second subchambers, said dividing means having an opening through which air may pass from said first subchamber into said second subchamber, blower means intermediate said prefilter panel and said HEPA type filter panel for forcibly blowing air from said first subchamber through said dividing means opening and into said second subchamber, whereby air will be drawn through said prefilter panel into said first subchamber and will be forced into said second subchamber and exhausted through said HEPA type filter panel, pressure responsive indicator means responsive to a predetermined increase in pressure in said second subchamber for indicating when said HEPA type filter panel requires changing, said blower means including an electric blower motor, the speed of which may be varied by varying the voltage applied thereto, a voltage supply circuit, and means for varying the voltage applied by said circuit to said blower means, said voltage varying means including switch means connected to said voltage supply circuit and operable in two alternative positions for supplying two alternative voltages for operation of said blower motor at two alternate speeds, one of which is sufficient to generate pressure conditions within said second subchamber sufficient to actuate said pressure responsive means if the HEPA type filter panel requires changing, control means responsive to a predetermined signal for effecting movement of said switch means from one of said alternative positions to the other, signal applying means operatively connected to said control means for applying an actuating signal to said control means, said signal applying means including radio frequency receiver and signal circuit means operated by said receiver in response to receipt of a predetermined transmitted frequency for applying an actuating signal to said control means, and means for generating the predetermined radio frequency for actuating said radio receiver, whereby said blower means may be remotely controlled to test the condition of said HEPA filter panel.

3,936,285

GLASS FIBER SIZING METHOD

John Maaghul, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 7, 1974, Ser. No. 512,646
Int. Cl.² C03C *25/02*
U.S. Cl. 65—3 C **3 Claims**

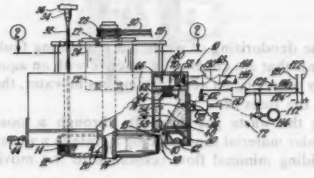
1. In the method of forming glass fibers comprising:
forming glass fibers from molten cones of glass at the tips of orifices in a bushing by attenuation;
sizing said glass fibers with an aqueous sizing composition;
gathering said fibers into strand; and
collecting said glass fiber strand, the improvement comprising:
sizing said glass fibers with an aqueous sizing composition comprising:
1 to 10 percent of a water solubilized carboxylated unsaturated polyester resin, said polyester resin substantially insoluble and aromatic solvents;
2 to 10 percent by weight of a second unsaturated, water insoluble polyester resin, said second polyester resin being insoluble in said first solubilized polyester resin, said second polyester resin preventing the migration of said sizing composition;
2 to 10 percent by weight of a plasticizer;
0.1 to 1.5 percent by weight of methacryloxyalkyltrialkoxy silane to promote adhesion between said glass fibers and said resin matrix;
0.1 to 1.5 percent by weight of an amino silane coupling agent;
1 to 6 percent by weight of an acrylic thermoplastic polymer being of sufficient low molecular weight to impart pressure sensitive adhesive characteristics to said sizing composition and a major amount of water.

3,936,286

GLASS FIBERIZER WITH IGNITION SYSTEM

Peter A. Dunkailo, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 30, 1974, Ser. No. 510,530
Int. Cl.² C03B *37/04*
U.S. Cl. 65—14 **2 Claims**



1. In apparatus for forming fibers from molten glass including in combination, a hollow spinner having an orificed peripheral wall, means for supplying molten glass to said spinner, means for rotating said spinner thereby centrifuging streams of molten glass from said orifices, attenuating means including an annular combustion chamber having an annular exit adjacent the peripheral wall of said spinner such that the mixture combusted therein exits said chamber transversely engaging

the molten streams of glass, the improvement comprising, a combustion chamber lighting system including an ignition burner located outside of said combustion chamber and having a flame passage communicating with said combustion chamber, and means for supplying an air-fuel mixture to said ignition burner.

3,936,287

METHOD FOR MAKING GLASS-CERAMIC ARTICLES EXHIBITING HIGH FRANGIBILITY

George H. Beall, Big Flats; William T. Brydges, III.; Joseph Ference, both of Corning, and Theodore R. Kozlowski, Horseheads, all of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 28, 1974, Ser. No. 437,008

Int. Cl. C03c *15/00*; C03b *29/00*

U.S. Cl. 65—30 E 9 Claims

1. A method for making a unitary glass-ceramic article exhibiting a modulus of rupture in excess of about 150,000 psi which will, upon fracture through the application of essentially no external energy, fragmentize violently, and wherein the crystal assemblage thereof constitutes at least 75% by volume of the article, said article having an integral surface compressive stress layer and an interior tensile stress portion which comprises:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis, of about 13–15% MgO, 1–3% B_2O_3, 23–26% Al_2O_3, 48–51% SiO_2, 4–8% TiO_2, and 3–7% ZrO_2, wherein the total TiO_2+ ZrO_2 ranges between about 9–13%;

b. simultaneously cooling the melt to at least within the transformation range thereof and shaping a glass body therefrom;

c. heating said glass body to a temperature between about 900°–1050°C. for a period of time sufficient to crystallize said glass body to a glass-ceramic article wherein the crystal assemblage constitutes at least 75% by volume of the article and consists predominantly of alpha-quartz and sapphirine;

d. contacting said glass-ceramic article with a source of lithium ions at a temperature between about 850°–1000°C. for a period of time sufficient to replace at least part of the magnesium ions of said Mg^{+2} ion-containing crystals in a surface layer within the article to a depth of at least 1% of the cross section thereof with lithium ions on a two lithium ions-for-one magnesium ion basis to produce crystals of lithium-stuffed beta-quartz solid solution crystals in said surface layer; and then

e. cooling said article to room temperature to thereby produce an article having an integral compressively stressed surface layer and an interior tensilely stressed portion.

3,936,288

METHOD FOR MAKING A GLASS-CERAMIC RECUPERATOR

Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 333,402, Feb. 16, 1973. This application Dec. 10, 1974, Ser. No. 531,235

Int. Cl.² C03B *32/00*; C03C *27/00*

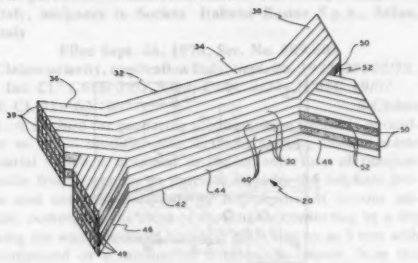
U.S. Cl. 65—33 17 Claims

17. A method for making a recuperator heat exchange assembly, comprising

a. providing first and second pluralities of layers of elongated tubes formed of a glass that is thermally crystallizable to a low expansion glass-ceramic having a coefficient of lineal thermal expansion of about −18 to +50 × 10^{-7}/°C over the range of 0° – 300°C, each of said tubes being filled with a fluid medium that is expansible in response to the application of heat and having sealed ends to retain said expansible fluid medium entrapped therein;

b. each of said tubes having an essentially straight central portion and header connector portions continuing from each end of the central tube portion to the sealed ends of the tube, the header connector tube portions of said first plurality of layers diverging away from the header connector tube portions of said second plurality of layers at the ends of said central tube portions when one of said layers is placed on top of the other of said layers;

c. stacking the central tube portions of said first and second pluralities of layers one above the other with the axes thereof all essentially parallel and with the central tube portions of each first plurality layer in heat exchange relationship with the central tube portions of a second plurality layer, the header connector tube portions at each end of said central tube portions of each layer being arranged so that the connector tube portions of said first layers diverge from the connector tube portions of the second layers to provide four sets of separated header connector tube portion ends, each set of header connector tube portion ends for one of said first and second



pluralities of layers extending from the stacked array of tubes as a plurality of tube layers spaced apart by the central tube portions of the other of said first and second pluralities of layers;

d. filling the spaces between the layers and around the tubes adjacent the ends thereof of each set of header connector tube portions with a header connecting material that is thermally crystallizable to a low expansion glass-ceramic having substantially the same coefficient of lineal thermal expansion as said tubes to seal each set against fluid flow between the tubes;

e. constraining the outer surfaces of the assembly of tube layers and header connecting material to prevent outward movement of the assembly; and

f. heat treating the constrained assembly to soften the elongated tubes and enable the fluid medium therein to expand and urge the tubes into contact with adjacent tubes and said header connecting material to fuse said assembly into an integral mass, and to effect crystallization of said tubes and header connecting material into a low expansion glass-ceramic.

3,936,289

METHOD AND APPARATUS FOR SELECTIVELY COOLING GLASS DURING ITS ADVANCE ALONG A MOLTEN METAL SURFACE

E. Kears Pollock, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 15, 1974, Ser. No. 514,979

Int. Cl.² C03B *18/02*

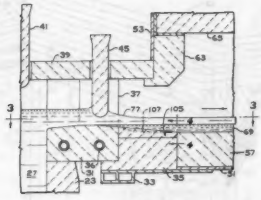
U.S. Cl. 65—65 A 7 Claims

1. In a process for making flat glass wherein molten glass is delivered onto the surface of a pool of molten metal in an enclosed forming chamber having a bottom, an upstream inlet end, a downstream outlet end, and a roof and side walls extending from the upstream end to the downstream end of the chamber and providing an enclosed space between them and

beneath the roof; advancing the glass along the surface of the pool of molten metal from the upstream end toward the downstream end of the chamber; cooling the advancing glass to form a dimensionally stable, continuous sheet of glass therefrom; and removing the continuous sheet of glass from the forming chamber, wherein the advancing glass has a tendency to drift from a direct path of advance; the improvement for treating the glass substantially immediately following its delivery onto the molten metal comprising

maintaining the depth of the molten metal beneath the glass sufficiently deeper in the central portion of the chamber than in the marginal portions of the chamber spaced inwardly from the side walls such that the glass in the central portion is cooled to a greater degree than the glass in the marginal portions, whereby the glass maintains its advance along a path substantially aligned with the centerline of the chamber midway between the side walls of the chamber.

4. In an apparatus for making flat glass comprising a forming chamber, means for delivering a layer of molten glass to the forming chamber; and means for removing a formed con-



tinuous sheet of flat glass from the forming chamber; wherein the forming chamber includes a bottom, an upstream end adjacent the molten glass delivery means, a downstream end adjacent the glass sheet removal means, side walls extending from the upstream end to the downstream end and upwardly from the bottom and a roof extending between the side walls and between the upstream and downstream ends providing an enclosed space, the enclosed space containing a pool of molten metal on the bottom for receiving and supporting glass delivered thereto and a headspace overlying the pool of molten metal; means for advancing glass along the surface of the pool of molten metal; and means for cooling the glass during its advance for forming it into a continuous sheet; the improvement wherein

the bottom of the chamber in a region spaced inwardly from the side walls of the chamber and adjacent the upstream end of the chamber is shaped to provide a sufficiently greater depth of molten metal in a central portion of the chamber than along marginal portions of the chamber spaced inwardly from the side walls of the chamber such that the glass in said central portion is cooled to a greater degree than the glass in said marginal portions.

3,936,290

NOVEL FLAT GLASS-PRODUCING FURNACE

Richard L. Cerutti, Seminole, and Henry M. Demarest, Jr., Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 8, 1974, Ser. No. 458,911
Int. Cl.² C03B 5/16, 5/22
U.S. Cl. 65—134 13 Claims

1. In a continuous tank-type furnace producing flat glass of high temperature melting, highly volatile glass batch making ingredients comprising a melter, a canal and flat glass forming means, said melter comprising:

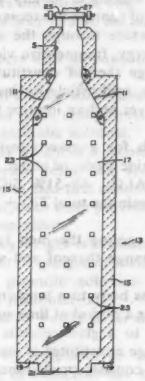
a. a back end wall and front end walls,

b. a top and bottom wall, two generally parallel side walls which define a channel in which the molten glass proceeds from the back wall to the front end walls,

said front end walls having an opening therethrough to permit the passage of glass to flow into the canal which has a narrower cross-section than the melter, the improvement comprising tapered front end walls converging inwardly towards one another from the width of the melter to the width of the canal, such that the angle the front end walls make with the side walls is at least about 140°.

8. A method of making glass comprising:

introducing into a melting zone a glass batch containing an ingredient which is volatile at the elevated temperatures required for melting over a prolonged time so as to cause an adverse loss of said ingredient from the glass, said melting zone having an initial portion thereof defined by spaced substantially parallel boundaries extending toward a molten glass outlet,



heating said glass batch until it is in a molten state,

flowing said molten glass through said initial portion of said melting zone toward the end of the melting zone and said molten glass outlet along a substantially straight linear path of flow, and applying forces to said flowing molten glass at the terminal end of each said boundary of the initial portion of said melting zone and maintaining said forces so as to divert and constrict the flow of molten glass to said outlet, said forces being sufficient to divert the flow of the molten glass at each side edge thereof along lines of flow forming an angle of at least about 140° with the line of flow of the molten glass along the edge thereof at the adjacent boundary of said melting zone,

whereby to streamline the flow of portions of the molten glass along said side edges and thereby decrease the average residence time of said glass portion and decrease the loss of volatilizable components of the molten glass.

3,936,291

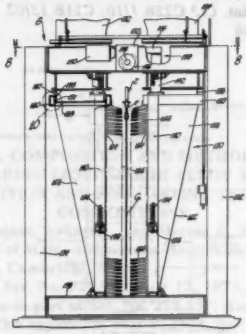
GLASS SHEET TEMPERING BLASTHEAD

Harold A. McMaster, 707 Riverside Drive, Woodville, Ohio 43469

Continuation-in-part of Ser. No. 280,617, Aug. 14, 1972, abandoned, and a continuation-in-part of Ser. No. 435,130, Jan. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 365,939, June 1, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,326
Int. Cl.² C03B 27/00
U.S. Cl. 65—351 18 Claims

1. A glass tempering blasthead comprising: a pair of plenum chambers, each of said plenum chambers having fluid flow distributing assemblies providing opposed banks of nozzles for

directing cooling fluid onto opposite surfaces of a sheet of glass disposed therebetween, said fluid flow distributing assemblies each including a pair of complementary sheet members, each of said sheet members having a free edge spaced from its respective plenum chamber and being formed with a series of depressions spaced from each other by nozzle portions, each of said nozzle portions and depressions extending inwardly from the free edge of the respective sheet member with a depression between each adjacent pair of nozzle portions, each depression and nozzle portion having an inner end remote from said free edge, the inner end of each depression curving away from said free edge and the inner ends of the adjacent pair of nozzle portions, said sheet members each being formed with a transverse feed passage portion projecting transversely outwardly from the inner ends of said depressions, said pair of complementary sheet members being joined together such that each depression of one sheet member is in complementary abutting relationship with a depression of the other sheet member, and each nozzle portion of one sheet member is in opposed complementary relationship with a nozzle portion of the other sheet member to form a nozzle having an outlet at the juxtaposed free edges of said sheet members and a flared inlet defined by the curved inner ends of the depressions on opposite sides of the nozzle, and said transverse feed passage portions of said sheet members cooperate to define a transverse feed passage projecting from the respective plenum chamber and extending transversely of said nozzles, said transverse feed passage communicating along its length with said plenum chamber and nozzles for transmitting fluid flow from said plenum chamber into the flared inlets of said nozzles each of said plenum chambers having side walls, and further including a plurality of U-shaped components extending across the side walls of the plenum chambers, said U-shaped components having base portions forming the inner faces of the respective plenum chambers and each having a pair of spaced, parallel leg portions projecting from its respective base portions, said leg portions being defined by said sheet members, said components being disposed in side-to-side relationship across the edges of the side walls of the respective plenum chambers such that a leg portion of one component is disposed in complementary relationship with a leg portion of the adjacent components.



18. A glass tempering blasthead comprising a stationary supporting frame having a pair of spaced overhead beams; a motor driven shaft rotatably supported on said overhead beams; an eccentric nonrotatably secured to said shaft; a yoke; said yoke having a base portion supported on said eccentric and a pair of depending leg portions; a pair of plenum chambers; said plenum chambers being supported by the leg members of the yoke; a spring connected between each overhead beam and each plenum chamber for resiliently supporting the plenum chamber with respect to said overhead beam; each of said plenum chambers having an open inlet end; and including a stationary inlet duct received in the inlet end of each of said plenum chambers for conducting air under pressure to said plenum chamber; and dry seal means mounted between the relatively reciprocating surfaces of said inlet ducts and inlet ends of said plenum chambers to prevent leakage therebetween.

3,936,292

COMPOSITIONS FOR USE IN AGRICULTURE AS SOIL MODIFIERS AND THEIR METHOD OF MANUFACTURE

Luigi Piccolo; Benedetto Calcagno, both of Milan; Marcello Ghirga, Bresso (Milan), and Antonio Paolinelli, Milan, all of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Sept. 26, 1974, Ser. No. 509,609

Claims priority, application Italy, Sept. 26, 1973, 29397/73

Int. Cl.² C05D *3/02, 9/00;* **C10C** *1/244;* **C01G** *49/02*

U.S. Cl. 71—63 **8 Claims**

1. A method for preparing a composition useful in agriculture as a soil modifier and fertilizer starting from a waste material which is obtained in the manufacture of titanium dioxide from ilmenites or ilmenite slags by the sulphate process and consists essentially of heptahydrated ferrous sulphate, comprising the steps of thoroughly contacting by a dry mixing the waste material having a grain size up to 3 mm with a compound or a mixture of compounds chosen from the group consisting of potassium carbonate, ammonium carbonate and the oxides, hydroxides and carbonates of calcium and magnesium, said compound or mixture of compounds being alone or in mixture in an ore and said compound or said ore having a grain size from 0.01 to 0.8 mm, at a temperature of from 20°C to the melting point of the heptahydrated ferrous sulphate, thereby obtaining a conversion reaction product consisting essentially of ferrous hydroxide and at least one sulphate of the group consisting of sulphates of calcium, magnesium, potassium and ammonium, and submitting the said conversion reaction product to oxidation in the presence of oxygen or a gas containing molecular oxygen at a temperature from 20° to 80°C to convert at least 90 percent of the ferrous hydroxide into ferric hydroxide.

3,936,293

METHOD OF SELECTIVE WEED CONTROL WITH CERTAIN CHLOROACETAMIDES

Paul Rathgeb, Basel, Switzerland; Jean Claude Tournayre, Lunel, France, and Christian Vogel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 331,168, Feb. 9, 1973, Pat. No. 3,875,228.

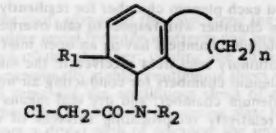
This application Jan. 20, 1975, Ser. No. 542,531

Claims priority, application Switzerland, Feb. 11, 1972, 2034/72

Int. Cl.² A01N *9/20*

U.S. Cl. 71—118 **7 Claims**

1. Process for the selective control of undesired plant growth in useful plant crops which comprises applying to the plant area a growth controlling effective amount of an active substance corresponding to the formula



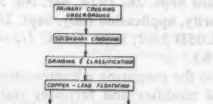
wherein R_1 represents hydrogen, methyl or ethyl; R_2 represents hydrogen, methyl, ethyl, n-propyl, isopropyl, methoxyethyl, allyloxymethyl or lower alkyloxymethyl; and n denotes the number 3 or 4.

3,936,294

REAGENT FOR ZINC ORE AND METHOD OF UTILIZING SAME

Kenneth A. Childress, Box 350, Webb City, Mo. 68490

Filed Aug. 28, 1974, Ser. No. 501,221
Int. Cl.² C22B *1/00*; B03D *1/14*
U.S. Cl. 75—2 **6 Claims**



1. A method of activating zinc sphalerite mineral for flotation in an aqueous media comprising adding to said media a quantity of a solution selected from the group consisting of an ammoniated aqueous solution of $CuCl_2$, an ammoniated aqueous solution of $CuCO_3$, and an ammoniated aqueous solution comprising $CuCl_2$ and $CuCO_3$.

3,936,295

BEARING MEMBERS HAVING COATED WEAR SURFACES

John Edward Cromwell, Baltimore, and Glenn Francis Hyde, Timonium, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 322,482, Jan. 10, 1973, abandoned. This application Feb. 15, 1974, Ser. No. 443,080
Int. Cl.² C23C *7/00*; B22F *1/02*
U.S. Cl. 75—0.5 R **10 Claims**

1. A powder mixture for plasma spraying onto a wear surface of a bearing member comprising by weight:

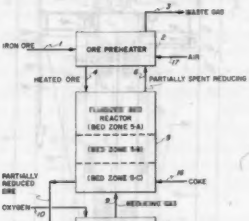
0 – 10.5% Ni-Al particles,
said Ni-Al particles consisting of
4.5 – 22% elemental aluminum and
78 – 95.5% elemental nickel;
26.7 – 85% Ni-Mo particles;
said Ni-Mo particles consisting of a core of
40 – 60% elemental molybdenum encapsulated in
60 – 40% elemental nickel;
15 – 39% sintered WC-Co particles,
said sintered particles consisting of a matrix of
10 – 14% elemental cobalt particles containing
86 – 90% tungsten carbide particles; and
0 – 47.8% intermetallic alloy particles,
said alloy particles consisting of
63.9 – 77.6% nickel-cobalt alloy of which no more than 1% is cobalt,
0.6 – 1.3% carbon,
3.0 – 5.0% silicon,
13.0 – 20.0% chromium,
2.75 – 4.75% boron, and
3.0 – 5.0% iron.

3,936,296

INTEGRATED FLUIDIZED REDUCTION AND MELTING OF IRON ORES

Donald L. Campbell, 5 Cambridge Dr., Short Hills, N.J. 07078

Filed Feb. 25, 1970, Ser. No. 14,119
Int. Cl.² C22B *1/10*; C21B *13/02*
U.S. Cl. 75—26 **11 Claims**



1. A method of reducing and refining iron ore by combining separate reducing refining zones whereby the gas generated in the refining zone is used to fluidize and partially reduce finely divided iron ore in the reduction zone at temperatures below about 1900°F. and the partial reduced ore is subsequently transferred and processed in the refining zone, the improvement comprising:

a. introducing the partially reduced iron ore transferred from the reducing zone and processed in the refining zone below the molten iron-containing metal in the refining zone;
b. introducing a carbonaceous fuel and oxygen in the refining zone to generate sufficient heat to melt and refine the transferred partially reduced iron ore and to liberate a reducing gas having a CO/CO_2 ratio of from about 4:1 to about 9:1 at a temperature of about 2600°F. to 3000°F., and
c. transferring said reducing gas from the refining zone to fluidize and partially reduce the iron ore in the reducing zone to a metallization ranging from about 30 pecent to about 85 percent.

3,936,297

METHOD OF PRODUCING AUSTENITIC STAINLESS STEEL

Albert G. Harttine, III, Tarentum, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 251,637, May 8, 1972, Pat. No. 3,820,980. This application Jan. 4, 1974, Ser. No. 430,853
Int. Cl.² C22C *38/38*
U.S. Cl. 75—130.5 **9 Claims**

1. A method for producing a substantially nonporous, austenitic stainless steel consisting essentially of, in weight percent, from 10 to 30% chromium, from 21 to 45% manganese,

from 0.85 to 3% nitrogen, up to 1% carbon, up to 2% silicon, balance essentially iron and residuals; which comprises the steps of: preparing a melt containing from 10 to 30% chromium, from 15 to 45% manganese, up to 1% carbon up to 2% silicon and balance iron and residuals, alloying the melt at an ambient pressure of about one atmosphere, with nitrogen in an amount of from 0.85 to 3%; balancing the elements in accordance with the following equations:

$$\frac{30\,(\%C + \%N) + 0.5\,(\%Mn)}{\%Cr + 1.5\,(\%Si)} \geq 1.5$$

$$\%Cr + 0.8\,(\%Mn) - 11.88\,(\%N - 0.1) - 28.25 \geq 0$$

and solidifying the melt.

3,936,298

METAL COMPOSITION AND METHODS FOR PREPARING LIQUID-SOLID ALLOY METAL COMPOSITION AND FOR CASTING THE METAL COMPOSITIONS

Robert Mehrabian, Arlington, and Merton C. Flemings, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 379,990, July 17, 1973, which is a continuation-in-part of Ser. No. 278,457, Aug. 7, 1972, abandoned. This application May 1, 1974, Ser. No. 465,756

Int. Cl. C22c *33/00*

U.S. Cl. 75—134 R **8 Claims**

1. A metal composition comprising a metal alloy containing discrete degenerate dendritic primary solid particles in a concentration of up to 65 percent by weight based upon said alloy, said primary solid particles being derived from the alloy and being suspended homogeneously in a secondary phase, said secondary phase being derived from the alloy and having a lower melting point than said primary solid particles, said secondary phase containing third phase solid particles homogeneously dispersed in said secondary phase, said third phase particles having a different composition from said primary solid particles and said secondary phase and having a surface composition that is not wet by the metal alloy when said alloy is a liquid.

3,936,299

METHOD FOR PRODUCING TOOL STEEL ARTICLES

Gary Steven, Pittsburgh, Pa., assignor to Crucible Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 822,672, May 7, 1969, Pat. No. 3,627,514. This application Sept. 14, 1971, Ser. No. 180,412

Int. Cl.[3] B22F *1/00, 3/00*

U.S. Cl. 75—224 **6 Claims**

1. A method for producing a tool steel article characterized by fine, globular, evenly dispersed carbides, and a combination of good cutting performance and machinability comprising compacting a powdered alloy charge of the following composition, in weight percent:

Carbon	1 to 2.5
Chromium	4 to 6
Vanadium	1 to 8
Tungsten	7.5 to 13
Molybdenum	3.5 to 7
Cobalt	9 to 15
Nitrogen	At least about .03
Iron	Balance

said compacting being conducted after heating said charge and with said charge at elevated temperature to produce a compact of a density greater than about 95%.

6. A method for producing a tool steel article characterized by fine, globular, evenly dispersed carbides, and a combination of good cutting performance and machinability comprising placing in a gas-tight container a powdered metal charge of the following composition, in weight percent:

Carbon	1 to 1.4
Chromium	4 to 6
Vanadium	1 to 1.5
Tungsten	7.5 to 13
Molybdenum	3.5 to 7
Cobalt	9 to 15
Nitrogen	.03 to .08
Iron	Balance

heating said container and charge to an elevated temperature in excess of about 2000°F, removing from said container gaseous reaction products resulting from said heating and compacting said charge to a density greater than about 95% prior to said charge cooling below a temperature of about 1900°F.

3,936,300

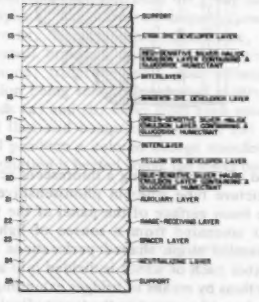
GLUCOSIDE HUMECTANT AS SILVER HALIDE EMULSION STABILIZER

Paul A. Cardone, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 303,008, Nov. 2, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 502,160

Int. Cl.[2] G03C *5/54, 7/00, 1/40, 1/34*

U.S. Cl. 96—29 D **12 Claims**



1. In a photosensitive element including at least one light-sensitive silver halide emulsion layer, each of which having a dye image-providing material associated therewith, the improvement which comprises including in at least one of the layers of said element an amount of a glucoside humectant effective to stabilize said emulsion against fog during storage; wherein said glucoside humectant is alpha methyl glucoside.

3,936,301
PROCESS FOR CONTACT PHOTOLITHOGRAPHY UTILIZING A PHOTOMASK HAVING INDENTED CHANNELS

Martin Victor Schneider, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

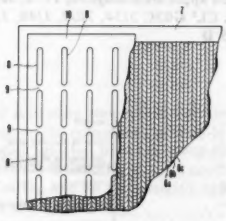
Filed Apr. 1, 1974, Ser. No. 456,555
Int. Cl.² G03C 5/00, 5/06
U.S. Cl. 96—36 5 Claims

1. A process for photolithographic printing of a planar structure on a substrate wafer comprising the steps of:
applying a photoresist material onto the surface of the substrate wafer to form a relatively flat portion and a build-up at the periphery of the wafer,
forming a mask having a desired pattern thereon,
cutting in the mask a channel corresponding to the peripheral build-up of the photoresist,
placing the mask in contact with the relatively flat portion of the photoresist, the build-up being positioned within the channel,
exposing the photoresist to light through the mask to form a pattern in the photoresist, and
removing portions of the wafer surface in accordance with the pattern in the photoresist.

3,936,302
METHOD FOR MANUFACTURING FLUORESCENT SCREENS FOR USE IN COLOUR PICTURE TUBES

Yasuji Takami; Kenji Fukuda, both of Mobara, and Eiichi Yamazaki, Ichihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 7, 1973, Ser. No. 330,233
Claims priority, application Japan, Feb. 7, 1972, 47-12874
Int. Cl.² G03C 5/00
U.S. Cl. 96—36.1 3 Claims



1. A method of manufacturing a fluorescent screen for use in a colour picture tube wherein photosensitive substances coated on the inner surface of the panel of the tube are exposed to light emanated from a source of light through a plurality of parallel stripe shaped perforations of a colour selecting member each of which is divided into a plurality of slit shaped sections by means of bridges extending at substantially right angles with respect to the longitudinal direction of said perforation thereby forming a fluorescent screen including a plurality of parallel stripes of three colour phosphors, said perforations extending over substantially the entire length of one side of said colour selecting member, improvement in which said fluorescent screen is formed by projecting the exposure light emanated from a linear light source upon said photosensitive substances through said divided slit shaped sections, said linear light source being positioned parallel to said perforations and having an effective length sufficient to expose continuous stripes corresponding to said perforations on said photosensitive substances including the regions behind said bridges.

3,936,303
PHOTOGRAPHIC PHOTOSENSITIVE ELEMENT AND DEVELOPING METHOD THEREOF

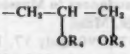
Keisuke Shiba; Seiiti Kubodera; Hideki Naito, and Takeshi Hirose, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 3, 1974, Ser. No. 485,655
Claims priority, application Japan, July 3, 1973, 48-75126
Int. Cl.² G03C 1/76, 7/16; C07D 3/17
U.S. Cl. 96—74 19 Claims

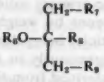
1. A silver halide photographic photosensitive element comprising a hydrophilic colloidal layer having dispersed therein photographic additives in a fatty oil which:
is liquid at room temperature;
boils at temperatures higher than 250°C under atmospheric pressure;
is soluble in water in a proportion of about 10% by weight or less; and
dissolves water in a proportion of about 5% by weight or less, said fatty oil being selected from the group consisting of the compounds of the general formula (I)

(I)

wherein R_1, R_2, and R_3, which can be the same or different, each is an acyl group containing 8 or less carbon atoms, and where at least one of R_1 and R_3 may be



wherein R_4 and R_5, which can be the same or different, each is the same as R_2, or the fatty oil is selected from the group consisting of the compounds of the general formula (II):



(II)

wherein
R_6 is the same as R_2, and R_7, R_8, and R_9, which may be the same or different, each is an alkoxycarbonyl group containing 4 to 8 carbon atoms; or
the fatty oil is selected from the group consisting of compounds of the general formula (III):

$$R_{10} - CH_2 - (CH_2)_n - CH_2 - R_{11} \quad \text{(III)}$$

wherein R_{10} and R_{11} which may be the same or different, each is the same as R_7, and n is an integer of 1 to 6.

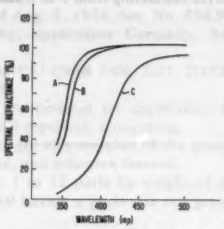
3,936,304
ARTICLE HAVING A WHITENED POLYOLEFIN SURFACE

Tsuneo Kasugai; Nobuhiko Minagawa, both of Fujinomiya; Yasushi Hamada; Yujiro Sugahara, both of Tokyo, and Hiroyuki Naito, Tsuruoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation-in-part of Ser. No. 213,531, Dec. 29, 1971, abandoned. This application Oct. 12, 1973, Ser. No. 405,986
Claims priority, application Japan, Dec. 29, 1970, 45-121449
Int. Cl. D21h 1/28
U.S. Cl. 96—82 4 Claims

1. An article comprising a substrate coated with a layer of a polyolefin composition containing particulate titanium phosphate as a white pigment, the titanium phosphate ($mTiO_2.n$-

P_2O_5) having an *m/n* ratio larger than 2.0, said polyolefin composition reflecting large proportions of ultraviolet rays of



wavelengths shorter than 400 mμ as compared to titanium dioxide.

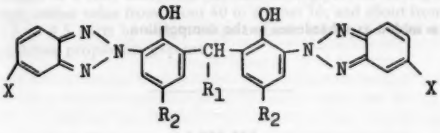
3,936,305

COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL CONTAINING ULTRAVIOLET RAY-ABSORBING COMPOUND

Shigetoshi Hiraishi; Kiyoshi Futaki; Shoichi Horii, and Kiyoshi Yamashita, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

Filed Dec. 2, 1974, Ser. No. 528,925
Claims priority, application Japan, Dec. 3, 1973, 48-134404
Int. Cl.² G03C *1/84*
U.S. Cl. 96—84 UV 13 Claims

1. A color photographic photosensitive material which comprises a support and photographic layers coated thereon, said photographic layers having incorporated therein an ultraviolet ray-absorbing compound represented by the formula:



wherein R_1 is an alkyl group having 1 to 13 carbon atoms, R_2 is an alkyl group having 1 to 18 carbon atoms and X is a member selected from the group consisting of hydrogen, halogens, alkyl, alkoxy, aryloxy, aralkyloxy and aryl groups.

3,936,306

PROCESS FOR PRODUCING GELATINO-SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS HAVING A HIGH SILVER HALIDE CONTENT

Minoru Minoda; Haruo Masuda; Mitsuru Suzuki, and Hiroki Chikamasa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 35,547, May 7, 1970, abandoned.
This application June 28, 1974, Ser. No. 484,018
Claims priority, application Japan, May 7, 1969, 44-34967
Int. Cl.² G03C *1/76*
U.S. Cl. 96—87 R 5 Claims

1. In a process for producing a gelatino silver halide light-sensitive material containing a high silver halide content which includes applying first a gelatino silver halide emulsion layer having a silver halide to gelatin weight ratio of at least 0.8 and then a gelatin-containing protective layer to a non-hygroscopic film support having good dimensional stability, and then drying of said layers, the improvement which comprises drying said layers on the support in two stages wherein

a. in a first stage said layers are dried to a water content less than 300% and near the critical moisture content with air having a relative humidity of from 10 to 35% and
b. in a second stage said layers are dried to remove water content of less than 300% and below the critical moisture content with air having a relative humidity of from 50 to 75%, said water content being based on the mean drying amount as defined by:

$$\frac{\text{the weight of water in the layers}}{\text{the weight of solids on the support}} \times 100.$$

3,936,307

LIGHT AND HEAT SENSITIVE COMPOSITION FOR PRODUCING A COLORED TRANSFER COMPLEX IMAGE

Shirow Asakawa; Katsue Hasegawa; Reiji Sano, and Shunsuke Matsuda, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 2, 1973, Ser. No. 384,925
Claims priority, application Japan, Aug. 3, 1972, 47-78127
Int. Cl.² G03C *1/00, 1/68*
U.S. Cl. 96—90 R 9 Claims

1. A photosensitive composition essentially consisting of a dispersion phase in the form of discrete particles of (a) an aromatic compound having an electron donative group and being polymerizable upon exposure to actinic light and (b) an organic compound having a double bond conjugated with an electron attracting group relative to said electron donative group in a solid-hydrophilic-film-forming vehicle in which said combination is insoluble, said compound (a) being a compound selected from the group consisting of N-vinylcarbazole, vinylanthracene, N-benzylacrylamide, N-methoxyphenylmethaacrylamide, β-naphthylvinyl ether, p-phenylstyrene, vinyldiphenylamine, acenaphthylene, vinyl fluorene, β-vinylnaphthalene, 2-vinylphenanthrene, 3-vinylphenanthrene, 1-vinylpyrene and p-phenylenediacrylpropionate, said compound (b) being a compound selected from the group consisting of tetrabromoethylene, 1,2-dibromo-1-iodoethylene, α-chloro-3,5-dinitrostyrene, tetracyanoquinodimethane, tetracyanoethylene, chloranil, bromanil, quinone, anthraquinone, 2,4,7-trinitrofluorenone, trinitrobenzene, and tetranitropyrene, said combination being selected such that melting points of said compounds (a) and (b) differ from each other by more than 10°C and that said compounds (a) and (b) react with each other and produce a colored charge transfer complex when said combination is heated above the lower one of said melting points.

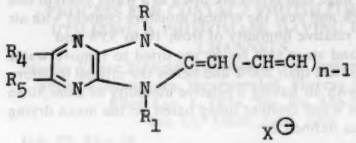
3,936,308

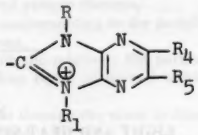
PHOTOGRAPHIC EMULSIONS CONTAINING METHINE DYES HAVING A 1H-IMIDAZO[4,5-B]PYRAZINE NUCLEUS

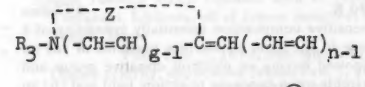
Wilbur Seth Gaugh; Donald Warren Heseltine; David Michael Sturmer, and John Paul Freeman, all of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

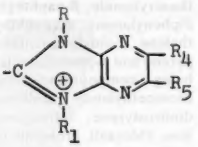
Filed Aug. 16, 1973, Ser. No. 388,867
Int. Cl.² G03C *1/18, 1/22*
U.S. Cl. 96—136 8 Claims

1. A light-sensitive photographic silver halide emulsion containing a sensitizing dye selected from those having one of the following formulas:

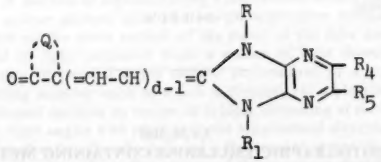








and



wherein *n* represents a positive integer of from 1 to 4; *g* represents a positive integer of from 1 to 2; *d* represents a positive integer of from 1 to 3; R, R_1, R_3, R_4 and R_5 each represents a member selected from the group consisting of an alkyl, alkenyl, alkaryl and an aryl substituent; R_4 and R_5 also each represent in the alternative a member selected from the group consisting of hydrogen and alkoxy; X^- represents an acid anion; Z represents the nonmetallic atoms required to complete a sensitizing heterocyclic nucleus of the type used in cyanine dyes containing from 5 to 6 atoms in the heterocyclic ring and Q represents the nonmetallic atoms required to complete a sensitizing heterocyclic nucleus of the type used in merocyanine dyes containing from 5 to 6 atoms in the heterocyclic ring.

3,936,309

HEAT-SENSITIVE RECORDING COMPOSITION AND SHEET

Isao Kohmura; Kiyoshi Futaki, both of Kyoto, and Yukio Tahara, Takasago, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Japan

Filed July 18, 1973, Ser. No. 380,238
Claims priority, application Japan, Aug. 5, 1972, 47-78026
Int. Cl.² C09D *11/04*
U.S. Cl. 106—21 **14 Claims**

1. In a heat-sensitive recording composition comprising a normally colorless or somewhat pale-colored chromogenic substance, a phenolic substance capable of developing the color of said chromogenic substance at an elevated temperature, and a water-soluble binder, the improvement wherein a compound having 2 to 10 1,2-epoxy ring structures

is added as a hardener to the composition.

3,936,310

HYDRAULIC COMPOSITION

Tadao Natsuume, Kawasaki, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1974, Ser. No. 456,880
Claims priority, application Japan, Apr. 4, 1973, 48-38440
Int. Cl.² C04B *7/02*, *7/35*
U.S. Cl. 106—90 **5 Claims**

1. A hydraulic composition comprising 100 parts by weight of a hydraulic substance and 0.01 – 5 parts by weight of a sulfosuccinic acid derivative, which latter compound is obtained by the addition reaction of a compound selected from the group consisting of maleic acid, fumaric acid, citraconic acid, mesaconic acid and the monoalkali metal salts, dialkali metal salts, alkaline earth metal salts, monoammonium salts and diammonium salts of these acids, with the compound selected from the group consisting of sulfurous acid, alkali metal sulphites, alkaline earth metal sulphites, ammonium sulphite, alkali metal hydrogen sulphites, alkaline earth metal hydrogen sulphites and ammonium hydrogen sulphite.

3,936,311

COATING MATERIAL FOR BUILDINGS

Paul-Gerhard Kirst; Karl Maier, and Heinz Winkler, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Aug. 5, 1974, Ser. No. 494,938

Claims priority, application Germany, Aug. 14, 1973, 2341085

Int. Cl.² C04B *1/00, 7/02, 7/352*

U.S. Cl. 106—90 5 Claims

1. A coating composition for application to buildings to render them water repellent, comprising:

a. 1 part by weight of a member of the group consisting of cement, lime, and mixtures thereof;

b. from about 1 to 12 parts by weight of a weatherproof filler material having a grain size not greater than about 7 mm.;

c. as a hydrophobing additive, about 0.1 to about 3% by weight, calculated on the total weight of dry material, of at least one water soluble ester of saccharose with a fatty acid containing from 10 to 20 carbon atoms.

3,936,312

COMPOSITION FOR THE PREPARATION OF COATINGS ON MEAT AND SAUSAGE GOODS

Mathias Stemmler, and Heinz Stemmler, both of Konrad Adenauer Ufer 35, 5000 Cologne 1, Germany

Filed May 3, 1974, Ser. No. 466,897

Claims priority, application Germany, May 17, 1973, 2324936; Mar. 15, 1974, 2412426

Int. Cl.² C08L *1/08*

U.S. Cl. 106—171 19 Claims

1. A coating composition for meat and sausage goods comprising a solution containing about from 20 to 75 parts by weight of a high viscosity cellulose propionate having a viscosity of about from 15 to 95 poise, about from 80 to 25 parts by weight of a fully acetylated distilled monoglyceride having a high iodine value from about 40 to at least 70, and about from 2.5 to 4.5 parts by weight of an organic solvent per part of cellulose propionate present.

3,936,313

METHOD OF PREPARING ADDITIVES FOR CALCIUM SULPHATE PLASTER

Bernt Sture Jürgen Ericson, Ornskoldsvik, Sweden, assignor to MoDoKemi AB, Stenungsund, Sweden

Filed Mar. 11, 1974, Ser. No. 450,033

Claims priority, application Sweden, Mar. 14, 1973, 7303581

Int. Cl.² C08L *1/28;* C04B *31/30*

U.S. Cl. 106—197 R 14 Claims

1. A process for preparing calcium sulphate plaster compositions comprising a water-retaining and setting-retarding cellulose ether salt dissolving rapidly in water and modifying the setting and water-retaining characteristics of the composition, which comprises adding to a water-soluble cellulose ether containing residual alkali resulting from alkali mercerization of the cellulose prior to etherification, an acid the alkali salt of which serves as a calcium sulphate plaster setting retarder, in an amount approximately stoichiometrically equivalent to the amount of alkali hydroxide present in the cullulose ether, thereby neutralizing the alkali and forming said retarder salt in situ in a ratio by weight of the water-retaining cellulose ether to the retarder salt within the range from about 20:1 to about 1:1, and then adding the cellulose ether-retarder salt additive to a calcium sulphate plaster composition in an amount within the range from about 0.1 to about 5% based on the weight of calcium sulfate of the composition.

3,936,314

SODIUM TETRABORATE CARRIER COATING FOR ROD

Walter Andrew Smigel, Homer, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 3, 1974, Ser. No. 430,437

Int. Cl.² C08L *91/00*

U.S. Cl. 106—243 7 Claims

1. The carrier coating concentrate consisting essentially of from about 10 to about 30% by weight of one or more waterinsoluble metal soaps selected from the group consisting of calcium, barium, aluminum, magnesium and zinc soaps of fatty acids having from about 12 to about 18 carbon atoms, from about 65 to about 89% by weight of sodium tetraborate, and from about 1 to about 5% by weight of one or more organic dispersing agents.

3,936,315

CONVERSION OF CRUDE PHTHALOCYANINES INTO PIGMENTS

Richard Milledge Ferrill, Jr., Glens Fall, N.Y., and Louis John Gagliano, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Nov. 4, 1974, Ser. No. 521,003

Int. Cl.² C09B *47/04*

U.S. Cl. 106—309 8 Claims

1. A process for converting a phthalocyanine crude into a pigment having high tinctorial strength, cleanliness and transparency, which process comprises grinding under conditions of shear, an essentially anhydrous charge consisting essentially of dry phthalocyanine crude, from about 2 to about 8 parts per part of crude of a particulate salt grinding aid, from 0.1 to 0.6 part per part of crude of an alkali metal hydroxide and sufficient of at least one organic liquid conditioning agent to form a dough-like cohesive mass and to maintain the charge under conditions of shear during grinding until a pigment of high tinctorial strength is obtained, and recovering the pigment from the ground charge.

3,936,316

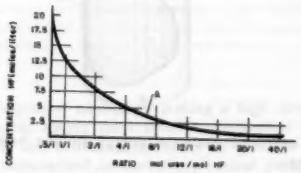
PICKLING SOLUTION

Michael Gulla, Newton, Mass., assignor to Shipley Company, Inc., Newton, Mass.

Filed Nov. 29, 1972, Ser. No. 310,371. The portion of the term of this patent subsequent to May 16, 1989, has been disclaimed.

Int. Cl.² C23G *1/02;* C09K *13/06*

U.S. Cl. 134—3 23 Claims



11. In a process for pickling a metal comprising the step of contacting said metal with a hydrohalide acid pickling solution consisting essentially of a hydrohalide acid, selected from the group consisting of hydrochloric acid and hydrobromic acid, where said acid is present in an amount of at least 0.5 moles per liter of solution, the improvement comprising the addition of urea to said hydrohalide acid in an amount of at least 0.5 moles per mole of acid and sufficient to substantially reduce fuming of said acid.

3,936,317

DISHWASHING COMPOSITIONS CONTAINING HIGHER 1,2-ALKANEDIOL ETHER MONOSULFATES

Hans-Jürgen Lehmann, Mettmann; Martin Bischoff, Gelsenkirchen; Horst Baumann, Leichlingen, and Peter Krings, Krefeld, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Continuation-in-part of Ser. No. 362,324, May 21, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,710

Claims priority, application Germany, June 2, 1972, 2226988; Feb. 27, 1973, 2309679

Int. Cl.[2] C11D *1/16, 1/29, 1/37, 17/08*

U.S. Cl. 134—29 9 Claims

1. Anionic surface active composition for manually washing and cleansing dishes consisting essentially of (A) from 20% to 90% by weight of a first component selected from the group consisting of alkyl sulfonates having 8 to 20 carbon atoms, olefin sulfonates having 8 to 20 carbon atoms, α-sulfofatty acid alkyl esters having 8 to 20 carbon atoms in the α-sulfofatty acid and 1 to 4 carbon atoms in the alkyl, dialkyl sulfosuccinic acid esters having 8 to 20 carbon atoms in the alkyls, alkylbenzene sulfonates having 8 to 20 carbon atoms in the alkyl, alkyl sulfates having 8 to 20 carbon atoms and the mixtures thereof and (B) from 10% to 80% by weight of a second component selected from the group consisting of a monoglycol ether monsulfate of a 1,2-alkanediol having 10 to 22 carbon atoms and a polyglycol ether monosulfate of a 1,2-alkanediol having 10 to 22 carbon atoms, said sulfation product containing per mol of ether diol from 0.7 to 1.1 moles of sulfuric acid ester and said sulfation product being an adduct of no more than 5 mols of an alkylene oxide having 2 to 3 carbon atoms on said diol said components (A) and (B) being present in the form of their salts selected from the group consisting of alkali metal salts, ammonium salts, lower alkanolamine salts, lower alkylamine salts, and the mixtures thereof.

3,936,318

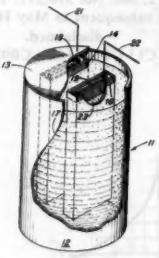
ELECTRICAL ENERGY STORAGE BATTERY MEANS

Charles F. Cole, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 13, 1975, Ser. No. 540,616

Int. Cl.[2] H01M *10/00*

U.S. Cl. 136—6 R 8 Claims



1. An improved electrical energy storage battery means comprising:

a. a case means;

b. at least two porous electrolyte container means positioned within said case means;

c. a solid hydrogel positioned within said case means and between said electrolyte container means, said hydrogel containing an effective amount of an electron transferring agent to render said hydrogel conductive;

d. at least one anode means positioned within at least one of said electrolyte container means;

e. at least one cathode means positioned within at least one of said electrolyte container means;

f. a second solid hydrogel positioned within said container means for said cathode, said gel being saturated with a compound selected from the group consisting of zinc chloride, zinc oxide, cadmium chloride and cadmium oxide to render same conductive; and,

g. a third solid hydrogel positioned within said container means for said anode, said gel being saturated with a compound selected from the group consisting of chromium chloride, chromium oxide, and alkali metal containing chromate salts to render same conductive.

3,936,319

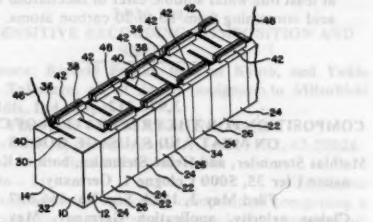
SOLAR CELL

Thomas R. Anthony; Harvey E. Cline, and Donald M. Winegar, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1973, Ser. No. 411,010

Int. Cl. H01l *15/02*

U.S. Cl. 136—89 44 Claims



1. A solar cell comprising

a body of semiconductor material having two opposed major surfaces substantially parallel to each other and a plurality of side surfaces;

at least one of the surfaces having a preferred planar orientation which is one selected from the group consisting of <100 >, <110 > and <111 >;

the body having a lamellar structure of integral alternate first and second regions of opposite type conductivity and a selected level of resistivity, the material of the second regions comprising recrystallized semiconductor material of the body having solid solubility of a dopant material therein to impart thereto the type of conductivity and the level of resistivity;

a plurality of first P-N junctions, each P-N junction being formed by the contiguous surfaces of each pair of mutually adjacent first and second regions and extending between and terminating in at least two opposed surfaces of the body;

means for electrically connecting all layers of the same type conductivity semiconductor material together into an electrical circuit arrangement, and

means for electrically connecting the regions of like conductivity into an electrical circuit external to the solar cell.

3,936,320

HEADER

David Earl Goslee, White Marsh, and Harold Newton Barr, Baltimore, both of Md., assignors to Nuclear Battery Corporation, Columbia, Md.

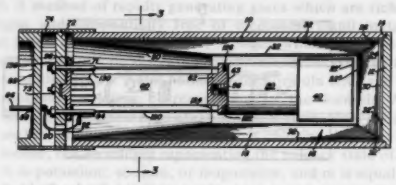
Continuation of Ser. No. 189,838, Oct. 18, 1972, abandoned. This application Jan. 7, 1974, Ser. No. 431,363

Int. Cl. H01v *1/00*

U.S. Cl. 136—242 7 Claims

1. A novel header for use in nuclear applications comprising a plate containing at least one bore, the inside surfaces of which carry a nickel coating, an alumina plug in said bore, said alumina plug sealed in said plug by means of a braze, and an integral niobium terminal passing through said plug, said

niobium terminal carrying a nickel coating on at least those surfaces where said terminal passes through said alumina plug,



said niobium terminal being sealed in said plug by means of a gold-copper or silver-copper braze heated to about 930°C.

3,936,321

METHOD OF MAKING A COMPOUND SEMICONDUCTOR LAYER OF HIGH RESISTIVITY

Daizaburo Shinoda, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Jan. 25, 1974, Ser. No. 436,802
Claims priority, application Japan, Jan. 31, 1973, 48-13107
Int. Cl.² H01L *21/00*
U.S. Cl. 148—1.5 **4 Claims**

1. A method of making a semiconductor layer having a high resistivity comprising the steps of:

implanting ions into a semiconductor comprising gallium and arsenic at a first acceleration voltage at a concentration higher than the limit of solid solubility of said ions in said semiconductor, said ions being of a material which forms a deep energy level in said semiconductor;

implanting protons into said semiconductor at an acceleration voltage not less than said first acceleration voltage; and

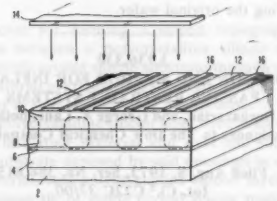
heating said semiconductor.

3,936,322

METHOD OF MAKING A DOUBLE HETEROJUNCTION DIODE LASER

Joseph M. Blum, Yorktown Heights; Billy L. Crowder, and James C. McGroddy, both of Putnam Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 29, 1974, Ser. No. 492,667
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **7 Claims**



1. In a method for making a narrow stripe double heterostructure junction laser having at least three superimposed layers wherein the first layer is GaAs, the second is $Ga_{(1-x)}Al_xAs$ and the third layer is GaAs, the latter region serving as the active region of the laser,

the improvement comprising bombarding through all said layers, save for a very narrow region, with a beam of oxygen ions so as to dope said bombarded regions and make them non-conducting at the operating currents of said junction laser,

and heating said layers after bombardment at a temperature of approximately 600°C for approximately 30 minutes.

3,936,323

METHOD FOR PRODUCING FERRITIC STAINLESS STEEL HAVING HIGH ANISOTROPY

Richard Kazeva, Lower Burrell, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Jan. 13, 1975, Ser. No. 540,366
Int. Cl.² C21D *9/48*
U.S. Cl. 148—12 EA **2 Claims**

1. A method for preparing deep drawing, stainless steel comprising:

A. preparing an alloy to contain from 12–14%w chromium, from 0.2–1.0% columbium, and not more than 0.75%w total of carbon, nitrogen, silicon, manganese, molybdenum, nickel, and copper;

B. hot rolling said alloy;

C. annealing said hot rolled alloy at a temperature of from 1600°F–1900°F for a period of from 50–150 minutes per inch of thickness; and

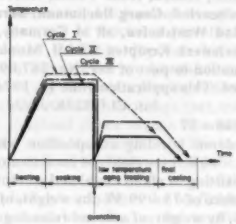
D. cold rolling the annealed steel to reduce the thickness at least 65 percent.

3,936,324

METHOD OF MAKING HIGH STRENGTH COLD REDUCED STEEL BY A FULL CONTINUOUS ANNEALING PROCESS

Kuniki Uchida; Kenzi Araki, both of Yokohama, and Shiro Fukunaka, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1975, Ser. No. 558,326
Int. Cl.² C21D *6/02*, *9/46*
U.S. Cl. 148—12 F **3 Claims**



1. An improved method of making a high strength cold reduced steel having most suitable mechanical properties required as safe countermeasures for an auto-car and other vehicles, chracterized in that the chemical composition is substantially adjusted within the range of 0.04 to 0.12% C. 0.50 to 2.00% Si, 0.10 to 1.60% Mn, unavoidable impurities and Fe, after cold reducing through the ordinary making process, the obtained cold reduced steel strip is subjected to the following full continuous annealing process in which:

a. recrystallization heating step rapidly heating the travelling strip to the range of 650°C to 900°C at rate of 200°C/min and more,

b. keeping and soaking step holding the strip for 10 to 120 sec. at the above heating temperature,

c. ordinary cooling down step to the room temperature from the above holding temperature,

d. and then ordinary coiling step.

3,936,325

FIBROUS BLANKET CONTAINING SOLDER FLUX AND SOLDER FLUX WITH INCREASED MELTED VISCOSITY

Dunbar L. Shanklin, 12 Everett Ave., Winchester, Mass. 01890

Continuation of Ser. No. 311,513, Dec. 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 96,598, Dec. 9, 1970, abandoned, and a continuation-in-part of Ser. No. 96,631, Dec. 9, 1970, abandoned. This application Sept. 23, 1974, Ser. No. 508,725

Int. Cl.² B23K *35/34*

U.S. Cl. 148—26 15 Claims

1. A solder flux of the type adapted to be used on high temperature solder baths, said flux consisting essentially of a fusible fluxing composition consisting essentially of a zinc-ammonium chloride composition and an effective amount in the order of at least about 0.1% by weight of the weight of the fusible fluxing composition of inorganic fibers.

3,936,326

SMOKELESS FLUXING AGENT FOR HOT-TINNING, HOT-GALVANIZING, AND HOT-LEADING OF ARTICLES MADE FROM IRON

Wolfgang Müller, Mannheim, Germany, assignor to Th. Goldschmidt AG, Germany

Filed Nov. 1, 1974, Ser. No. 520,139

Int. Cl.² B23K *35/34*

U.S. Cl. 148—26 5 Claims

1. A smokeless fluxing agent for hot-tinning, hot-galvanizing, and hot-leading iron articles comprising a mixture of zinc chloride, lithium chloride, an eutectic mixture of potassium chloride and sodium chloride, and containing no ammonium chloride.

3,936,327

BORIDING COMPOSITION

Walter Fichtl, Buttgen-Vorst; Gunter Wiebke, Munich; Helmut Kunst, Hanau, Hohe Tanne; Alfred Graf von Matuschka, Eschenried; Georg Bachmann, Berrendorf, and Alfred Lipp, Bad Worishofen, all of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Germany

Continuation-in-part of Ser. No. 287,093, Sept. 7, 1972, abandoned. This application June 10, 1974, Ser. No. 478,110

Int. Cl.² B23K *35/24*

U.S. Cl. 148—27 7 Claims

1. Powdered boriding composition which consists essentially of 1 - 10%, by weight, of an activator selected from the group consisting of alkali metal and ammonium borofluorides, and a mixture of 75 – 99.5%, by weight, of silicon carbide and 25 – 0.5%, by weight, of a boron-releasing agent selected from the group consisting of boron carbide, amorphous boron and ferroboron, based on the total weight of said mixture.

3,936,328

PROCESS OF MANUFACTURING SEMICONDUCTOR DEVICES

Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

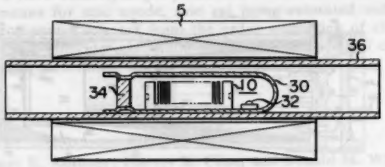
Continuation-in-part of Ser. No. 354,144, April 24, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 515,105

Claims priority, application Japan, Apr. 28, 1972, 47-43061

Int. Cl.² H01L *7/38*

U.S. Cl. 148—171 13 Claims

1. A process of manufacturing semiconductor devices comprising the steps of first forming a plurality of grooves in a substrate of semiconductive material to be substantially parallel to one another while an uncut portion is left in one portion of said substrate, thereby to form a wafer member including a plurality of semiconductive wafer units each defined by a different pair of adjacent grooves, all the wafer units being maintained integrally with one another through said uncut portion of said substrate and then processing said wafer member by growing semiconductor material on each of said plurality of wafer units from a liquid phase.



3,936,329

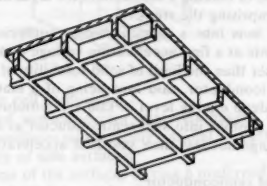
INTEGRAL HONEYCOMB-LIKE SUPPORT OF VERY THIN SINGLE CRYSTAL SLICES

Don Leslie Kendall, Richardson, and John C. Knowles, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 3, 1975, Ser. No. 546,378

Int. Cl.² H01L *21/20*

U.S. Cl. 148—187 16 Claims



1. A method of forming very thin semiconductor slices which comprises the steps of:

a. providing a wafer of semiconductor material of predetermined crystallographic orientation and of predetermined conductivity type;

b. forming a mask on a surface of said wafer;

c. etching in said wafer through said mask to form parallelogram shaped grooves

d. removing said mask and depositing semiconductor material in said grooves and along said surface of said wafer of the same conductivity type as said wafer but of lower dopant concentration; and

e. removing the original wafer.

3,936,330

COMPOSITION AND METHOD FOR INFLATION OF PASSIVE RESTRAINT SYSTEMS

Thomas E. Dergazarian, and George A. Lane, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1973, Ser. No. 386,815

Int. Cl.² C22C *37/00*

U.S. Cl. 149—35 17 Claims

1. A composition which burns to produce gases which are rich in nitrogen and substantially free of elemental alkali metals, oxides of nitrogen and alkali metal oxides, which comprises:

an intimate mixture of an alkali metal azide of the formula MN_3, a metal halide of the formula RX_n and an inorganic oxidizer corresponding to the formula $A(ClO_4)_m$ wherein M is an alkali metal; R is tin, zinc, cobalt, nickel, calcium or magnesium; X is chlorine, bromine or iodine, n is an integer representing the valence state of R; A is potassium, sodium, or magnesium and m is equal to the valence

of A, said constituents provided in amounts so that upon burning of the composition, the combustion products are substantially free of oxides of nitrogen, elemental alkali metals, HCN and alkali metal oxides.

13. A method of rapidly generating gases which are rich in nitrogen and substantially free of elemental alkali metals, alkali metal oxides and oxides of nitrogen which comprises:

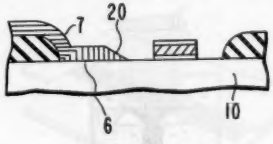
igniting an intimate mixture of an alkali metal azide of the formula MN_3, a metal halide of the formula RX_n and an inorganic oxidizer corresponding to the formula $A(ClO_4)_m$ wherein M is an alkali metal; R is tin, zinc, cobalt, nickel, calcium or magnesium; X is chlorine, bromine or iodine, n is an integer representing the valence state of R; A is potassium, sodium, or magnesium, and m is equal to the valence of A, said constituents provided in amounts so that upon burning of the composition, the combustion products are substantially free of oxides of nitrogen, elemental alkali metals, HCN and alkali metal oxides.

3,936,331

PROCESS FOR FORMING SLOPED TOPOGRAPHY CONTACT AREAS BETWEEN POLYCRYSTALLINE SILICON AND SINGLE-CRYSTAL SILICON

Robert L. Luce, Los Altos, and Arthur J. Bovaird, Santa Clara, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 1, 1974, Ser. No. 456,499
Int. Cl.² H01L 7/50
U.S. Cl. 156—17 5 Claims



1. A process for forming a sloped topography buried contact area between a polycrystalline silicon conductive layer and a single crystal silicon substrate through openings in insulation material overlying said substrate without creation of deep crevices in said contact area, comprising:

forming a polycrystalline silicon layer over at least a portion of said insulating material and over the single crystal silicon substrate exposed by said openings in said insulation material, said polycrystalline silicon layer including a contiguous tip of single crystal silicon material where said polycrystalline silicon layer contacts said exposed single crystal silicon substrate; and

defining said polycrystalline layer by masking those areas of said polycrystalline silicon layer to be retained and

etching unwanted polycrystalline silicon areas including said contact area with an orientation selective etch which etches polycrystalline silicon preferentially to single crystal silicon whereby unwanted polycrystalline silicon is removed while said contiguous tip of single crystal silicon material inhibits creation of deep crevices in said contact area.

3,936,332

COPPER AND COPPER ALLOY ETCHING SOLUTIONS AND PROCESS

Akira Matsumoto, and Katsutoshi Itani, both of Fuji, Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1974, Ser. No. 510,535
Claims priority, application Japan, Nov. 19, 1973, 48-129156
Int. Cl.² C23F 1/00; C09K 13/06
U.S. Cl. 156—18 10 Claims

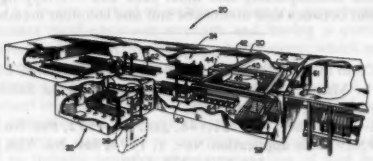
6. In the process for etching copper and copper alloys with an aqueous peroxysulfate solution containing from 5 percent by weight to its solubility limit therein of a peroxysulfate, the improvement which comprises adding to said aqueous solution from 50 p.p.m. to its solubility limit therein of a diazine compound and from 5 p.p.m. to 2,000 p.p.m. of a halogen compound, thereby increasing rate of the etching, said halogen compound being a compound which liberates halogen in an aqueous solution.

3,936,333

METHOD FOR PREFABRICATING BRICK PANELS

Gage B. Behunin, Arvada, Colo., assignor to Masonry Systems International, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 192,027, Oct. 26, 1971, abandoned. This application Mar. 15, 1974, Ser. No. 451,429
Int. Cl.² E04B 2/00
U.S. Cl. 156—60 6 Claims



6. A method of prefabricating brick panels in a plant having a storage area for a supply of bricks, a plurality of workbenches, and motorized scaffolds disposed for reciprocal movement along both sides of the workbenches comprising the steps of mixing a supply of mortar, pouring the mortar into a plurality of mortar pots stored on a storage cart, transferring the mortar pots by overhead crane means from the storage cart to the motorized scaffolds, transferring bricks from the storage area to the motorized scaffolds, moving the scaffolds in a first horizontal direction adjacent the side of the associated workbenches, placing bricks from the scaffolds in a first row on the associated workbenches as the scaffolds move along the sides thereof, reversing the direction of movement of the scaffolds in a second horizontal direction opposite to said first direction and spreading a layer of mortar onto the top of the bricks in said first row as the scaffolds move in said second direction, again reversing the direction of movement of the scaffolds in said first direction and placing a second row of bricks on the spread layer of mortar.

3,936,334

COLLAPSABLE TUBE

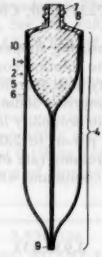
Hideo Kushida; Yoshio Hara; Toshie Tanaka; Takeshi Itakura, and Shinsaku Nakazato, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 314,920, Dec. 14, 1972, abandoned. This application June 24, 1974, Ser. No. 482,370
Claims priority, application Japan, Dec. 25, 1971, 47-3152
Int. Cl.² B29C 27/14
U.S. Cl. 156—69 11 Claims

1. A process for fabricating a double-walled collapsable tube, comprising:

forming a shoulder member having a lower peripheral face, an annular connecting portion extending downwardly from the inner edge of said face, a circumferential edge adjacent to and above said peripheral face, and a neck on an upper portion of said shoulder member and adapted to receive a closure member;

joining an end of a flexible inner tube to said shoulder member with said end abutting said lower peripheral face



and with the inside surface of said inner tube adjacent said end mating against the outside surface of said annular connecting portion; and

joining an end of a resilient outer tube to said shoulder member with the inside surface of said end abutting said circumferential edge of said shoulder member, said outer tube encompassing said inner tube and overlapping the joint between said inner tube and said shoulder member.

3,936,335

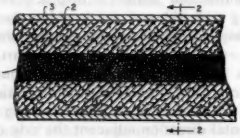
PROCESS FOR PRODUCING A BUOYANT FISHING LINE

Leon L. Martuch, Winter Park, Fla., assignor to Scientific Anglers, Inc., Midland, Mich.

Division of Ser. No. 221,148, Jan. 27, 1972, Pat. No. 3,849,929. This application Nov. 1, 1974, Ser. No. 520,116

Int. Cl.² B32B *5/20*

U.S. Cl. 156—79 **7 Claims**



1. A process for the preparation of a buoyant fishing line comprising (a) coating a thread with foamable material; (b) foaming said foamable material; (c) braiding a filamentous line around a core comprised of said foamed material; (d) coating the resultant line, from step (c), with a primer; (e) coating the resultant line, from step (d), with a flexible surface coating; and (f) curing said surface coating.

3,936,336

METHOD OF FORMING REINFORCED PLASTICS ARTICLES UTILIZING OPENWORK TUBES

Leslie Nathan Phillips, Farnborough, England, assignor to National Research Development Corporation, London, England

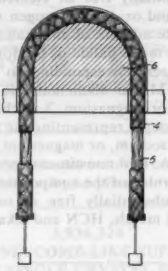
Filed Oct. 23, 1970, Ser. No. 83,457

Claims priority, application United Kingdom, Oct. 24, 1969, 52192/69

Int. Cl.² B32B *31/14*; B29C *27/00*

U.S. Cl. 156—86 **8 Claims**

1. A process for the production of a reinforced plastics article comprising the steps of placing the reinforcement and the plastics, in an uncured or part cured state, within a tube of deformable openwork construction arranged so that elongation of the tube results in a significant decrease in its internal cross-sectional area cross-section, supporting the tube



with at least a portion of the external surface of the tube exposed to allow a significant flow of said plastics through said surface, elongating said tube so that it compacts the plastics and reinforcement, and providing for the curing of said plastics.

3,936,337

APPARATUS AND PROCESS FOR THE MANUFACTURE OF STRUCTURAL MATS

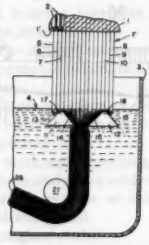
Hans Stapp, Momlingen, Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Dec. 16, 1974, Ser. No. 532,885

Claims priority, application Germany, Dec. 18, 1973, 2362856[U]; Dec. 18, 1973, 7344708[U]

Int. Cl.² D04H *3/16*

U.S. Cl. 156—167 **10 Claims**



1. In a process for the manufacture of a structural mat by melt-spinning continuous thermoplastic polymer filaments vertically downwardly in a plurality of rows onto the surface of a liquid cooling bath which exerts a sufficient buoyant force to laterally spread the individual filaments at the bath surface into helical to sinuous loops which become self-bonded at overlapping points of intersection of adjacent filaments within a bonding zone lying a short distance below the bath surface and then withdrawing the resulting coherent mat from the bath, the improvement which comprises:

at least partly compressing the mat between opposing stationary guide surfaces as it is withdrawn from said bonding zone; and

contacting at least one of the outermost rows of filaments corresponding to at least one of the upper and lower surfaces of the mat with a second stationary guide surface which diverges outwardly from one of said first-mentioned guide surfaces at a short distance below the bath surface such that said at least one outermost row of filaments is deflected in a path inwardly and upwardly over

an apex onto said one of said first-mentioned guide surfaces so as to be incorporated into an outer bonded and flattened surface of the mat.

8. In apparatus for the manufacture of a coherent structural mat of parallel rows of continuously looped thermoplastic filaments with the mat being flattened and densified on both its upper and lower surfaces, the improvement in combination with a spinning head having a plurality of parallel rows of spinning nozzles to melt-spin said filaments, a cooling bath means to receive and helically to sinuously loop the filaments and means to withdraw the mat from the bath which comprises:

opposing stationary guide plates converging downwardly toward each other below the bath surface and intersecting the bath surface in a line parallel to the filament rows to provide means to compress the mat therebetween to form its upper and lower surfaces;

at least one additional stationary guide plate diverging downwardly and outwardly from one of said first-mentioned guide plates to form an apex therewith in a line positioned at or below the bath surface parallel to and falling within at least one outermost row of filaments falling vertically down from said spinning nozzles such that said at least one outermost row of filaments is drawn inwardly and upwardly on said additional guide plate over the apex and then downwardly between the two opposing guide plates.

3,936,338
ENDLESS FIBREGLASS BELTING

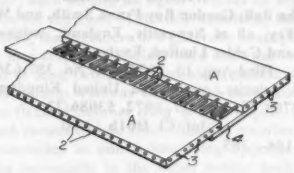
Howard Thomas Gibson, Keighley, England, assignor to Fothergill & Harvey Limited, Summit, England

Filed Nov. 18, 1974, Ser. No. 524,897

Claims priority, application United Kingdom, Nov. 28, 1973, 55150/73

Int. Cl.² B65H *69/06*

U.S. Cl. 156—157 **6 Claims**



1. In a method of making a permanent joint between the edges of two woven fiberglass yarn belt sections that are surface coated on both sides with a high temperature resistant heat fusible fluoro-polymer material and wherein the yarns in said belt sections comprise one group extending generally parallel to the belt edges and another group extending generally at right angles to said edges, the steps of

a. applying strips of glass fibre tape on the upper and lower surfaces of said belt sections along each of the edges to be joined, said tapes having films of heat fusible fluoro-polymer material in contact with the fluoro-polymer material on the belt section ends,

b. applying heat to fuse said contacting fluoro-polymer materials together,

c. stripping said tapes off the belt sections for removing along therewith fused coating from the yarns at said belt section edges;

d. removing the uncoated yarns of said one group, leaving the yarns of said other group projecting at substantially right angles from the belt section edges,

e. bringing together the belt end sections to be joined and interdigiting the projecting yarns in a joint region,

f. applying films of high temperature resistant heat fusible fluoro-polymer material over the interdigited yarn region and across the adjacent belt section end surfaces, and

g. applying heat and pressure to fuse said films and consolidate them with said belt section edges and the yarns in said region for forming a permanent bonded joint having substantially the thickness of the belt sections.

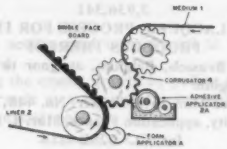
3,936,339
IN-LINE PROCESS FOR THE PRODUCTION OF CORRUGATED BOARD

James A. Lock, Monroe, N.Y.; Leroy C. Hofmann, Saddle River, N.J., and Chester P. Kulesza, Statesville, N.C., assignors to International Paper Company, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,547

Int. Cl.² B31F *1/22*

U.S. Cl. 156—205 **18 Claims**



1. An in-line method of making corrugated paperboard with excellent rigid-when-wet strength and having a corrugated medium and at least one liner attached thereto, which method comprises applying to at least one liner or said corrugated medium a rapidly collapsible foam of a dispersion of a water resistant impregnating resin, bringing said corrugated medium and said liner into adhesive contact with each other, heating the resulting composite to complete collapsing of said foam and to thereby complete the impregnation of said medium with said resin, and finally drying said composite after the completion of the collapse of said foam by further heating.

3,936,340
METHOD FOR MAKING CORRUGATED COLLIMATORS FOR RADIATION IMAGING DEVICES

Gerd Muehllehner, Mount Prospect, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 52,924, July 7, 1970, abandoned. This application Feb. 16, 1973, Ser. No. 332,934

Int. Cl.² B32B *31/12*; G21C *11/00*

U.S. Cl. 156—210 **5 Claims**

1. A method of making a radiation imaging collimator having collimating apertures converging substantially to a common focus comprising the steps of:

a. producing a plurality of flat strips of lead foil about 0.01 inches in thickness and of uniform width having opposing curved concave and convex edges;

b. inserting each strip, one-at-a-time, between a pair of partly meshed bevel gears having longitudinally extending teeth that focus to a common point such that each of said strips is positioned with said convex edge proximate to

said focal point and with said concave edge remove from said focal point;

c. rotating said bevel gears in a direction to sequentially form individual longitudinal corrugations so as to produce an initial corrugated strip;

d. pressing, one-at-a-time, said initial corrugated strips between male and female forming dies to produce final corrugated strips having highly regular, reproducible configurations;

e. mounting each of said corrugated strips between successive straight strips of lead foil each about 0.01 inches in thickness to produce a plurality of collimator apertures wherein all of said initial corrugated strips are positioned in alignment with each other; and

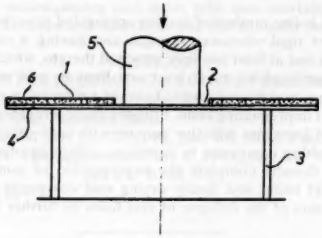
f. compressing said mounted strips to ensure alignment of said apertures such that all of said apertures are directed toward a common focus.

3,936,341

ADHESIVE LACQUER, PROCESS FOR ITS USE AND PRODUCTS THEREOF

Jean Nanoux, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed Mar. 6, 1974, Ser. No. 448,763
Claims priority, application France, Mar. 8, 1973, 73.08424
Int. Cl.² B29B *1/14*
U.S. Cl. 156—242 15 Claims



1. A process for joining a thermoplastic resin to a thermosetting resin, comprising applying a layer of an adhesive lacquer to the surface of the thermoplastic resin, said lacquer comprising tetrahydrofuran as a solvent and an acrylate ester polymer containing at least 50 mol % of an acrylate ester, and thereafter applying the thermosetting resin in uncured form to the layer of adhesive lacquer and curing the thermosetting resin.

3,936,342

STEEL PLATE BONDING PROCESS AND PRIMER COMPOSITION

Takashi Matsubara; Yuko Takeuchi, and Toshiro Hirose, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,557
Claims priority, application Japan, Feb. 15, 1973, 48-18543
Int. Cl.² B32B *15/08, 27/34, 27/38*
U.S. Cl. 156—330 8 Claims

1. A process for bonding steel sheets which comprises applying a primer composition comprising 0.1 to 2.5 weight parts of a bisphenol type A epoxy resin having a mean molecular weight greater than about 800 per 1 weight part of a thermosetting phenolic resin obtained by reacting an aqueous solution of a mixture of orthocresol and phenol in a weight ratio of orthocresol to phenol ranging from about 60 : 40 to 10 : 90 with formaldehyde in the presence of an alkali catalyst, to the surface of the steel sheets, curing the applied primer composition on the steel sheet surfaces, and then bonding said steel sheets with a polyamide.

3,936,343

TAPE REMOVAL MACHINE

Robert R. Walls, Los Angeles County, Calif., assignor to Western Magnum Corporation, Hermosa Beach, Calif.

Filed Apr. 8, 1974, Ser. No. 458,502
Int. Cl.² B32B *31/16, 35/00*
U.S. Cl. 156—368 11 Claims

1. A tape removing machine for removing tape which is adhesively secured to one side of a board so that it extends beyond one edge of the board comprising:

a roller, said roller comprising a mandrel and a jaw carrier, said mandrel having a substantially cylindrical exterior surface, said mandrel having an axis substantially central of said cylindrical surface and said mandrel having a jaw thereon, said jaw carrier being pivoted on said mandrel and having another jaw thereon, said jaw carrier being pivoted on said mandrel on the side of said mandrel axis away from said jaw carrier surface, a cylinder and piston respectively formed in said mandrel and on said jaw carrier so that fluid under pressure in said cylinder causes clamping of said jaws to clamp tape between said jaws and upon release of fluid pressure to release clamped tape and release circumferential tension;

means for rotating said roller so that as said roller is rotated when the tape is grasped in said jaws the tape is wound around said roller; and

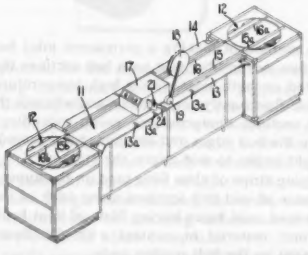
means for removing tape wrapped around said roller.

3,936,344

APPARATUS FOR USE IN THE MANUFACTURE OF A WIRING HARNESS

Lewis John Ball; Gordon Roy Frank Smith, and William Lawrence Fry, all of Newcastle, England, assignors to Rist's Wires and Cables Limited, England

Filed Aug. 13, 1973, Ser. No. 387,636
Claims priority, application United Kingdom, Aug. 12, 1972, 37708/72; Nov. 17, 1972, 53086/72
Int. Cl. H01b *13/00*
U.S. Cl. 156—385 14 Claims



1. Apparatus for use in the manufacture of a wiring harness, the apparatus including s platform upon which the harness leads, each including an outer thermoplastic sheath, are supported, the platform being arranged to support the leads in the pattern which they will occupy in the harness, and being apertured to permit lead-in, and branch-out of leads intermediate the ends of the harness, and, a heater unit movable along the length of the platform, said heater unit including a dispenser for dispensing thermoplastic tape onto the harness leads as the unit traverses the platform, means for heating the

mutually presented surfaces of the thermoplastic tape and the thermoplastic sheaths of the leads, and, a pressure member urging the heated surfaces of the tape and the leads into contact so that the sheaths of the leads fuse to the tape along the length of the tape as the unit traverses the length of the platform.

3,936,345

APPARATUS FOR WELDING FLEXIBLE MEMBERS INTO A FRAME

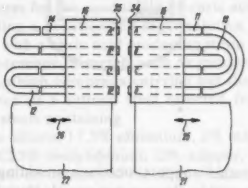
Ernst Pecha, Grosbettlingen, Germany, assignor to Bielomatik Leuze & Co., Wurttemberg, Germany

Division of Ser. No. 261,241, June 9, 1972, Pat. No. 3,853,655. This application July 17, 1974, Ser. No. 489,390

Claims priority, application Germany, June 11, 1971, 2128922

Int. Cl.² B31F *5/00*; **B65H** *19/00*, *69/02*; **G03D** *15/04*

U.S. Cl. 156—502 **7 Claims**



1. An apparatus for welding together elongated, flexible members at their respective end points to form a frame comprising:

a. two holders for the flexible members, at least one of said holders being adapted to move towards and away from the other, each having an equal number of separate receptacles for the ends of flexible members, the receptacles holding the members in a generally U-shaped configuration in a respective holder such that the first holder contains at least two of the flexible members in side-by-side relationship whereas the second holder contains at least one flexible member lying, at least in part, within the U-shaped mouth of one other flexible member, each of said receptacles in one holder lying opposite a corresponding receptacle in the other holder such that the respective end portions of the members which are to be welded together to form a frame lie adjacent each other;

b. means for moving at least one of the holders towards the other holder and thereby allow for their relative movement to bring the end portions of the flexible members into a position at which they can be welded to form the frame; and

c. means for welding the respective end portions of the flexible members together to form the frame.

3,936,346

CRYSTAL GROWTH COMBINING FLOAT ZONE TECHNIQUE WITH THE WATER COOLED RF CONTAINER METHOD

William W. Lloyd, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 428,266

Int. Cl.² B01J *17/10*

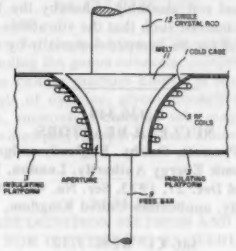
U.S. Cl. 156—620 **7 Claims**

1. A method of forming single crystal material from polycrystalline material which comprises the steps of

a. Providing an electrically conducting cold cage container having top and bottom apertures surrounded by RF coils,

b. feeding a rod of polycrystalline material into said bottom aperture,

c. inducing an electrical current in said container and said material to melt and levitate said material within said container, and to maintain said material free of said container,



d. placing a seed crystal in said metl to initiate crystal growth, and

e. continuing the crystal growth by pulling said seed away from said melt at a controlled rate while maintaining levitation of said melt.

3,936,347

PAPER COMPOSED MAINLY OF PULLULAN FIBERS AND METHOD FOR PRODUCING THE SAME

Tatsuo Nomura, Okayama, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Incorporated, Okayama, both of Japan

Filed Sept. 3, 1974, Ser. No. 502,860

Claims priority, application Japan, Sept. 5, 1973, 48-99903

Int. Cl.² D21H *5/12*

U.S. Cl. 162—146 **15 Claims**

1. A paper composed of pullulan fibers, or a mixture of 90 to 20% of pullulan fibers with 10 to 80% of vegetable fibers.

3,936,348

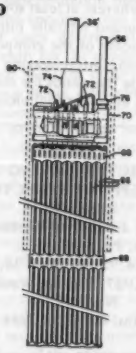
METHOD AND APPARATUS FOR DETECTION OF NUCLEAR FUEL ROD FAILURES

William J. Wachter, and Wesley M. Rohrer, both of Pittsburgh, Pa., assignors to Wesley M. Rohrer and William J. Wachter, both of Pittsburgh, Pa., part interest to each

Filed Feb. 5, 1973, Ser. No. 329,635

Int. Cl. G01m *3/24*; **G21c** *17/06*

U.S. Cl. 176—19 LD **1 Claim**



1. Apparatus for detecting a defective nuclear fuel rod in an assembly of such fuel rods immersed in a liquid, comprising a probe having a lower end adapted to engage said assembly of rods, a vibration detector attached to said probe, the lower

end of said probe contacting a fuel assembly immersed in said liquid whereby vibrations resulting from boiling or turbulent liquid which has leaked into a fuel rod will be transmitted through said probe to the vibration detector which will indicate the existence of a defective fuel rod, and an inverted bell connected to the lower end of said probe and adapted to slide down over a fuel rod assembly, whereby the bell displaces liquid within its interior such that the vibrations due to defective fuel rods will not be damped materially by the surrounding liquid.

3,936,349

NUCLEAR REACTORS

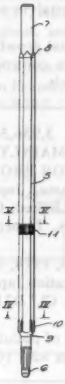
Robert Frank Prescott, Oadby, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 27, 1973, Ser. No. 428,748

Claims priority, application United Kingdom, Jan. 5, 1973, 858/73

Int. Cl.[2] G21C *3/32*

U.S. Cl. 176—78 **8 Claims**



1. A nuclear reactor core comprising

an array of closely packed elongate components, the components being arranged in groups with their longitudinal axes generally vertical,

support means for the array of components,

means for arranging at least some of the components of each group so that they tilt towards the centre of their respective group wherein at least some of the components of the group are urged laterally into abutment with one another, at least some of the components being nuclear fuel elements having interengaging splined bearing pad means intermediate their ends for resisting relative lateral movement of two adjacent fuel elements.

3,936,350

NUCLEAR REACTOR HAVING THERMALLY COMPENSATED SUPPORT STRUCTURE FOR A FUEL ASSEMBLY

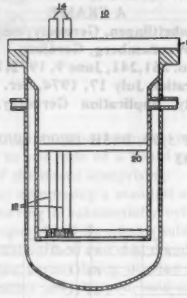
Ray Borst, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 92,981, Nov. 25, 1970, now Defensive Publication No. T901,027. This application Feb. 7, 1973, Ser. No. 330,358

Int. Cl. G21c *3/34*

U.S. Cl. 176—87 **4 Claims**

1. A nuclear reactor, including an upstanding vessel, a reactor core comprising a plurality of assemblies of elongated fuel rods housed within the vessel, and means within the vessel for supporting the fuel rods at a plurality of locations along the longitudinal dimension of the rods for maintaining the rods in a predetermined structural arrangement within the vessel, wherein the support means is constructed to have a measure of thermal expansion under designed reactor operating temperatures at each of the support locations along the rods substantially equal to the thermal expansion of the support



means at the other support locations providing support in a parallel plane within the reactor vessel, thus balancing the thermal expansions along parallel planes of support at the plurality of support locations to substantially retain alignment of core components.

3,936,351

METHOD FOR PREPARING GLUCORONYL-GLUCOSAMINO-GLYCAN SULPHATES EXHIBITING ANTILIPASAEMIC ACTIVITY

Pietro Bianchini, Modena, Italy, assignor to Opocrin S.r.l., Modena, Italy

Filed June 13, 1974, Ser. No. 479,036

Claims priority, application Italy, June 14, 1973, 25371/73

Int. Cl.[2] A61K *35/38*; **C12D** *3/00*; **C08B** *37/00*; **A61K** *31/70*

U.S. Cl. 195—4 **5 Claims**

1. A method of preparing glucosamino glycan sulphates with antilipaemic action comprising the steps of:

subjecting animal duodenum or pancreas to hydrolysis, in a suspension an aqueous solution of pH between about 5 and about 10 in the presence of an antibacterial agent acting exclusively as a bacterial flora inhibitor,

keeping the suspension at 30°–70°C for up to 48 hours without contact with air and then heating it to 70°–100°C for 10–40 minutes,

separating off the solid parts,

adding to the liquid obtained by separation an organic base having an aliphatic chain of at least 7 carbon atoms, in a quantity from 1% to 4% by weight of the weight of the animal organ treated, the liquid being then brought to pH from 7.5 to 8.5 with a 20–40% solution of an inorganic base,

heating the liquid to 70°–100°C for from 2 to 20 minutes to increase the precipitate and prepare it for centrifugation,

separating the solid parts from the liquid,

washing the precipitate first with distilled water and then with a saline aqueous solution of molarity from 0.5 to 1,

fractionating the precipitate with an aqueous solution of the same salt used for the previous washing with molarity from 2.5 to 4,

precipitating the desired compound from the solution using an alcohol having 4 carbon atoms or less and pH from 3 to 5.

3,936,352

PROCESS FOR THE PRODUCTION OF CITRIC ACID

Adel J. Kabil, Vienna, Austria, assignor to Aktiengesellschaft Jungbunzlauer Spiritus- und Chemische Fabrik, Scharzenbergplatz, Austria

Continuation-in-part of Ser. No. 146,555, May 24, 1971, abandoned. This application Oct. 12, 1973, Ser. No. 406,130
Claims priority, application Austria, June 1, 1970, 4891/70
Int. Cl.² C12D *1/04*
U.S. Cl. 195—36 R 6 Claims

1. In a process for the production of citric acid which comprises subjecting a decationized sugar solution to submerged fermentation with a citric acid producing strain of Aspergillus niger in the presence of metals such as iron and copper, the improvement which comprises providing a decationized sugar solution with a pH of about 2.8 and carrying out said fermentation in the presence of a refined steel which in addition to iron and copper contains at least one component selected from the group consisting of carbon, silicon, manganese, chromium, molybdenum, nickel, niobium and titanium, wherein the amount of copper in the steel is 2%.

5. In a process for the production of citric acid which comprises subjecting a decationized sugar solution to submerged fermentation with a citric acid producing strain of Aspergillus niger in the presence of metals such as iron and copper, the improvement which comprises carrying out the fermentation in the presence of a refined steel selected from the group consisting of steels containing

a. about 1% silicon, 17.5% chromium, 2% manganese, 20% nickel, 2.25% molybdenum, 2% copper, about 0.07% carbon and an amount of niobium which is greater than 8 times the carbon content; and
b. about 1% silicon, 18% chromium, 2% manganese 22.0% nickel, 2.75% molybdenum, 2% copper, about 0.07% carbon and an amount of niobium which is greater than 8 times the carbon content.

3,936,353

CONVERSION OF CARBOHYDRATE MATERIALS TO PETROLEUM TYPE HYDROCARBONS

Nai Yuen Chen, Titusville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 535,008
Int. Cl.² C12C *11/00*; C07C *15/02*
U.S. Cl. 195—37 3 Claims

1. In the process of converting carbohydrates to gasoline boiling range hydrocarbons comprising fermenting said carbohydrates to an intermediate product comprising water, alcohol and solid fermentation products; distilling the alcohol from said intermediate product; and converting said alcohol to said hydrocarbons by contacting such with a crystalline aluminosilicate zeolite catalyst having a silica to alumina ratio of at least 12 and a constraint index of about 1 to 12 at about 500° to 1000°F; the improvement which comprises instead of distilling said intermediate product, flashing said intermediate product to remove a distillate of alcohol and about 40 to 70 weight percent water therefrom; and directly contacting said wateralcohol distillate from said flashing with said zeolite at said temperature.

3,936,354

ANTI-TUMOUR PRODUCT OF BACTERIAL ORIGIN

Jean-Rock LaPointe, 410 62nd Ave., Chomedey Laval, Quebec, and Victorien Fredette, 331 Tait, Ville St. Laurent, Quebec, both of Canada

Filed Apr. 29, 1974, Ser. No. 465,074
Int. Cl.² C12K *3/00*, *1/10*
U.S. Cl. 195—79 3 Claims

1. A process of deriving an attenuated mutant strain of *Clostridium perfringens* which comprises attenuating the wild strain Lechien of *Clostridium perfringens* with N-methyl-N'-nitro-N-nitrosoguanidine.

3,936,355

MICROORGANISM GROWTH MEDIA AND THE STABILIZATION THEREOF

John W. Lawson, Kansas City, Mo., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 12, 1973, Ser. No. 415,013
Int. Cl.² C12K *1/10*
U.S. Cl. 195—100 4 Claims

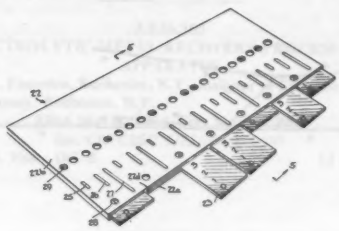
1. A medium for the induction of the wall defective forms of cocci, including the genus neisseria, comprising a standard virology tissue culture medium known as Medium 199, and added amounts of cysteine, glycerophosphate, alkali metal chloride salts, ammonium chloride salt, magnesium sulfate, glucose, detoxified polyvinylpyrrolidone albumin, and penicillin.

3,936,356

PROFILE RECOGNITION METHOD AND APPARATUS FOR IDENTIFYING BACTERIA

Pierre R. Janin, New York, N.Y., assignor to Analytab Products Inc., Plainview, N.Y.

Continuation-in-part of Ser. No. 349,698, April 10, 1973, abandoned. This application Mar. 21, 1974, Ser. No. 453,434
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R 23 Claims



1. In a method for the identification of an unknown substance, a specimen of the substance having been prepared to be analyzed, portions of the prepared specimen being caused to undergo a plurality of different tests, each test having a predetermined indicia when the specimen has not reacted and a different predetermined indicia when the specimen has reacted, the improvement which comprises:

a. arranging the tests into at least one group which includes a plurality of individual test determinations, each test determination being assigned a score value, the score value for each determination being different depending upon whether the specimen has or has not reacted, the score value of each determination in a group being weighted differently for the condition when the specimen has reacted, and the sum of any combination of score values in a group being different from the sum of any other combination of score values within the group;
b. comparing the predetermined indicia and the different predetermined indicia of each test to an apparatus having a supporting frame and at least one member corresponding to a group of determinations and containing a representation for the condition when the specimen has not reacted and a representation for the condition when the specimen has reacted, each member being divided into fixed increments, the magnitude of each increment being a function of the weighted score value for each determination in a group corresponding to the movable member, wherein sequential movements of the movable member provide a total movement representative of the combining of score values of the group and the correct indicia of reaction for each determination in a group;
c. in response to the step of comparing, moving each movable member through the increment for each determination in a group to which the movable member is related

when the specimen has reacted, the moving of the movable member both exposing the representation for the condition when the specimen has reacted and forming a score value for each determination, the movable member being moved sequentially until a total group score value for each group is obtained, the representation of each movable member after moving enabling the representation to be checked against the predetermined indicia and different predetermined indicia of the test; and

d. assembling the score values of all groups into a final value which is distinctive for each different combination of group score values, the final value being indicative of the identification of the unknown substance.

3,936,357

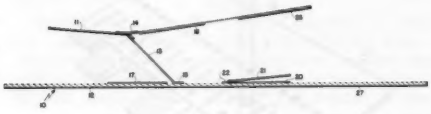
METHOD AND DEVICE FOR DETERMINING THE CONCENTRATION OF A SUBSTANCE IN A FLUID

Terry W. Milligan, Belmont, and Richard F. Wright, Acton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 16, 1974, Ser. No. 498,059

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **8 Claims**



1. A device for determining concentration of a substance in a fluid which comprises fluid absorbing means carrying a substantially non-swellable, absorbent material of constant porosity and thickness; a first and second sheet which are carrying a predetermined amount of reagents adapted to react with said substance to provide a visual indication of the concentration of said substance; at least one of said first and second sheets is transparent; said fluid absorbing means intermediate and pivotally secured at each end to said first and second sheets adapted to be moved to a first superposed position where said reagents and said substance coact; said fluid absorbing means and said first and second sheets adapted to be moved to a second superposed position to contact means for generating the visual indication of the concentration of said substance.

3,936,358

METHOD OF CONTROLLING THE FEED RATE OF QUENCH WATER TO A COKING DRUM IN RESPONSE TO THE INTERNAL PRESSURE THEREIN

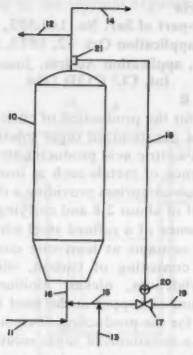
James E. Little, Fort McMurray, Canada, assignor to Great Canadian Oil Sands Limited, Toronto, Canada

Filed Oct. 17, 1974, Ser. No. 515,763

Int. Cl.² C10B *39/04, 39/06, 47/02;* C10G *9/14*

U.S. Cl. 201—39 **2 Claims**

1. In a process for preparing coke from a petroleum feed comprising thermally decomposing said petroleum feed in a coking drum at a temperature in the range of 700°F. to 1000°F. to provide a petroleum distillate product and a residual coke product, cooling the residual coke product with quench water, thereby producing steam which further cools the coke product and which increases the internal pressure in the coking drum the improvement which comprises measuring the internal pressure in the coking drum and in response thereto adjusting the rate of flow of said quench water to



maximize said rate of flow while maintaining a substantially constant and safe internal pressure within the coking drum.

3,936,359

PROCESS FOR THE PREPARATION OF PURE DEHYDROACETIC ACID

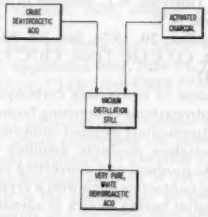
Adrian Marxer, Visp, Switzerland, assignor to Lonza Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 197,525, Nov. 10, 1971, abandoned. This application Jan. 25, 1974, Ser. No. 436,804

Claims priority, application Switzerland, Dec. 1, 1970, 17752/70

Int. Cl.² B01D *15/00*

U.S. Cl. 203—6 **14 Claims**



1. A process for the purification of crude dehydroacetic acid which comprises: admixing crude dehydroacetic acid and activated charcoal in a reduced pressure, simple vacuum distillation still; vacuum distilling said admixture, the distillate being vaporized, and the discoloring agents in the crude dehydroacetic acid not being vaporized and being adsorbed by the activated charcoal; and collecting the distillate, which is comprised of very pure, white dehydroacetic acid.

3,936,360

PROCESS FOR DISTILLATION AND RECOVERY OF OLEFINIC NITRILES

Hsin Chih Wu, Parma, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 132,008, April 7, 1971, abandoned. This application Feb. 9, 1973, Ser. No. 330,980

Int. Cl.² B01D *3/00, 3/10*

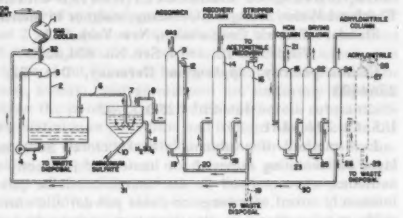
U.S. Cl. 203—75 **9 Claims**

1. In the process for the recovery and purification of acrylonitrile produced by the ammoxidation reaction of propylene,

molecular oxygen and ammonia in the presence of ammoxidation catalyst which consists of the steps of;

a. contacting the ammoxidation reactor effluent with an aqueous quench liquid in a quench system to produce a gaseous quench effluent from said quench system having a temperature of about 90° to about 230°F.;

b. removing the gaseious quench effluent from said quench system and absorbing said removed gaseous quench effluent in water to form a solutionn and distilling most of



the by-products produced in the ammoxidation reaction and most of the water from said solution to obtain a liquid stream containing crude acrylonitrile; and

c. distilling the crude acrylonitrile to obtain a gaseous overhead stream of product-quality acrylonitrile and a bottoms stream containing acrylonitrile and impurities and having a pH of about 3–5, the improvement comprising: recycling part of said liquid bottoms stream obtained in step (c) and using said liquid bottoms stream as at least part of said quench liquid in step (a).

3,936,361

IMAGE RECORDING MEMBER

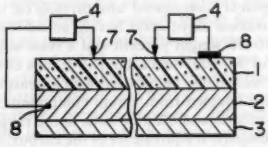
Yasushi Takatori, and Mitsunobu Nakazawa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1974, Ser. No. 454,979

Claims priority, application Japan, Mar. 26, 1973, 48-34332; Mar. 26, 1973, 48-34333

Int. Cl.² B21H *1/20*; B41C *3/08*

U.S. Cl. 204—2 **21 Claims**



1. In an electrical recording member provided with a recording layer consisting essentially of an image-forming agent, an electrically-conductive agent and a binder therefor, the improvement comprising said electrically-conductive agent comprising at least a compound containing zeolitic water, whereby an image is formed in said recording layer by the application thereto of electrical current.

3,936,362

PROCESS FOR THE MANUFACTURE OF AMMONIUM TUNGSTATE AMMONIUM PARATUNGSTATE, AMMONIUM METATUNGSTATE AND HYDRATED TUNGSTEN TRIOXIDE

Clarence D. Vanderpool; Martin B. MacInnis, and James C. Patton, Jr., all of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 10, 1974, Ser. No. 477,921

Int. Cl.² C25B *1/00, 1/22*; C01G *41/00*; C01B *1/00*

U.S. Cl. 204—86 **8 Claims**

1. An electrolytic method for producing a tungsten compound selected from the group consisting of ammonium tungstate, ammonium paratungstate, ammonium metatungstate and tungstic acid, the method comprising:

a. contacting the negative side of an anion exchange membrane with an aqueous electrolyte containing a source of tungstate anions, and contacting the opposing side of the membrane with an aqueous electrolyte containing a source of ammonium cations, and

b. applying an electrical potential across the anion exchange membrane, the potential having a magnitude and polarity to cause passage of the tungstate anions through the membrane into the electrolyte containing the ammonium cation source for a time sufficient to achieve a pH of the electrolyte to form the desired tungsten compound.

3,936,363

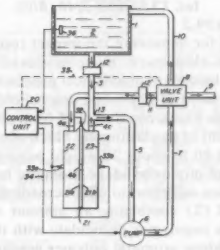
ELECTROLYTIC METAL RECOVERY PROCESS AND APPARATUS

John R. Fesseden, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 8, 1974, Ser. No. 467,963

Int. Cl.² C25C *1/22, 1/00, 7/00*

U.S. Cl. 204—105 R **14 Claims**

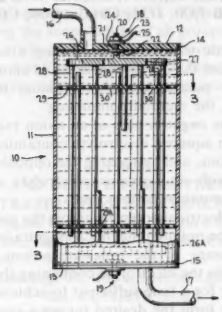


1. A system for electrolytically removing metal from a solution containining ions thereof, comprising, in combination, an electrolytic cell comprising an enclosed chamber having at least one cathode and at least one anode adapted to be connected to means for impressing an electrical potential, said cell being sealed, against communication with the ambient atmosphere, and said cell having an inlet and an outlet for solution; a source of such a solution; conduit means connected between said outlet and said inlet for recycling solution through said cell, said conduit means comprising a first conduit connected to said inlet for supplying solution to said cell; a second conduit connected to said outlet for removing solution from said cell; a pump having an inlet connected to said second conduit and an outlet connected to said first conduit, said pump being so constructed and arranged as to suck solution from said cell and said second conduit at a subatmosphere pressure and to discharge solution to said first conduit, whereby to maintain a subatmosphere pressure in said cell; and a third conduit connecting said source to said conduit means for supplying solution to said cell.

3,936,364
APPARATUS AND METHOD FOR TREATMENT OF WATER OLIGODYNAMICALLY

Sidney A. Middle, 1718 27th St., Columbus, Nebr. 68601

Filed Feb. 20, 1973, Ser. No. 333,648
Int. Cl.² C02B 3/10, 1/82
U.S. Cl. 426—66 4 Claims



2. The method of claim 1 wherein said step of reversing includes the step of:

reversing said current at intervals of approximately 1 minute.

3,936,365
RADIATION CROSSLINKED BLOCK COPOLYMER BLENDS WITH IMPROVED IMPACT RESISTANCE

Frank L. Saunders, Midland, and Ronald R. Pelletier, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 28, 1974, Ser. No. 473,642
Int. Cl.² C08F 2/46, 8/00
U.S. Cl. 204—159.2 10 Claims

1. A method for improving the impact resistance of a normally solid non-elastomeric monovinylidene aromatic polymer which is subjected to mechanical processing, said method comprising the steps of (1) subjecting colloidal size particles of an elastomeric block copolymer of from about 20 to about 80 weight percent of an elastomeric block of conjugated diene and from about 80 to about 20 weight percent of a non-elastomeric block of monovinylidene aromatic monomer to high energy irradiation sufficient to effect crosslinking of the block copolymer and (2) combining an amount of the resulting irradiated block copolymer particulate with the non-elastomeric monovinylidene aromatic polymer containing at least 70 weight percent of polymerized monovinylidene aromatic monomer wherein the amount of copolymer is sufficient to improve the impact strength of the non-elastomeric polymer, said crosslinking being sufficient to enable the block copolymer to remain in the form of colloidal size particles during mechanical processing, but less than that required to render the copolymer non-elastomeric.

3,936,366
RADIATION POLYMERISABLE COMPOSITIONS CONTAINING 3-SORBOYLOXY-2-HYDROXYPROPYL GROUPS

George Edward Green, Cherry Hinton, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 28, 1974, Ser. No. 446,990
Claims priority, application United Kingdom, Mar. 6, 1973, 10796/73
Int. Cl.² C08F 2/46, 8/18, 4/00
U.S. Cl. 204—159.23 28 Claims

1. A process for polymerising a polysorbate having, per average molecule, at least three 3-sorboyloxy-2-hydroxypropyl groups directly attached to ether oxygen atoms, which polysorbate has been obtained by the additive reaction of a compound containing at least three glycidyl groups with sorbic acid or of glycidyl sorbate with a substance having at least three phenolic or aliphatic hydroxyl groups, which comprises subjecting the polysorbate to actinic radiation.

3,936,367
METHOD OF PRODUCING A LAYER OF DARK COLORED HEAT RADIATING INSULATING MATERIAL FOR HEATERS OF INDIRECTLY HEATED CATHODES

Eberhard Weiss, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 18, 1974, Ser. No. 534,027
Claims priority, application Germany, Dec. 22, 1973, 2364403
Int. Cl.² C25D 13/02
U.S. Cl. 204—181 2 Claims

1. A method of producing a dark colored heat radiating layer of insulating material for heaters of indirectly heated cathodes, characterized in that aluminum-oxide powder is intimately mixed with tungsten-oxide powder and chromium-oxide powder, that a coating bath is prepared with said mixture and additions of aluminum nitrate, magnesium nitrate, ethanol and water, that the heaters dipped into said coating bath are coated electrophoretically with a porous, dark colored heat radiating layer of insulating material, with electrolysis taking place simultaneously, and that the heaters are then rinsed, in known manner, in a suitable liquid such as methanol, dried, and finally sintered in a nitrogen-hydrogen atmosphere at about 1,600°C.

3,936,368
METHOD FOR CURING A COATING FILM

Tadashi Watanabe, and Tsutomu Maruyama, both of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed Nov. 27, 1970, Ser. No. 93,466
Claims priority, application Japan, Dec. 3, 1969, 44-96484
Int. Cl.² C25D 13/06
U.S. Cl. 204—181 10 Claims

1. A method for curing a coating film upon a coated electroconductive object comprising in combination the steps of:

a. immersing said object in an electrophoretic bath comprising an aqueous dispersed composition characterized in that said composition is both electrodepositable as an adherent film upon an anode immersed therein and polymerizable thereon by applying ionizing radiation, said aqueous dispersed composition comprising an aqueous dispersion of an acidic film-forming binder, and said acidic film-forming binder being a conjugated unsaturated fatty acid, conjugated unsaturated oil or mixture thereof modified alkyd resin having an oil length in the range of 10–60 weight percent and a resin acid value in the range of 30–100, the carboxylic groups of said modified alkyd resin being neutralized with at least one water-soluble base selected from amino compounds, inorganic alkali compounds and alkaline salts, in the range of 0.7 to 1.2 stoichiometrical equivalents of the carboxyl groups of said modified alkyd resin,

b. providing a direct current through said bath sufficient to effect deposition of a film of said composition upon said object as an anode by providing a difference of electrical potential between said anode and other electrode,

c. transferring the resultant coated object from said bath containing said composition into an irradiation zone, and

d. applying to the electrodeposited film upon said object, a 0.1–40 M rad dose of ionizing radiation until said film is cured by polymerization.

3,936,369

HYDROCARBON CONVERSION WITH A SULFIDED CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Sept. 30, 1974, Ser. No. 510,255

Int. Cl.² C10G *35/08*; B01J *11/12*

U.S. Cl. 208—139 8 Claims

1. In a process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with a catalytic composite, comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.01 to about 5 wt. % germanium, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum or palladium, iridium, and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and iridium are present in the corresponding elemental metallic states and wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal, the improvement which comprises sulfiding the catalytic composite, prior to contact with the hydrocarbon, by treating the composite with a sulfiding gas at conditions selected in incorporate about 0.05 to about 0.5 wt. % sulfur.

3,936,370

PROCESS FOR PRODUCING A ZEOLITE RISER CRACKER FEED FROM A RESIDUAL OIL

Alfred M. Henke, Springdale, and Joel D. McKinney, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 22, 1973, Ser. No. 390,358

Int. Cl.² C10G *34/00*

U.S. Cl. 208—210 6 Claims

1. A process for demetallizing a feed residual petroleum oil containing asphaltenes, sulfur and metals including between 5 and 500 parts per million of nickel and vanadium to an effluent oil wherein the amount of nickel plus one-fifth the amount of vanadium is less than one part per million without a distillation or solvent extraction step for removal of nickel and vanadium comprising passing said feed oil and hydrogen through a plurality of hydrodesulfurization stages in series including an initial stage and a final stage each operating at a temperature between about 650° and 800°F., each stage employing a catalyst comprising Group VI and Group VIII metals on alumina, increasing the temperature in each stage with increasing catalyst age to compensate for catalyst activity aging loss, maintaining a lower hydrogen pressure in said final stage than in said initial stage, removing asphaltenes, metals and sulfur from the feed oil in said initial and said final stages with a greater amount of metals and sulfur being removed from the feed oil in said initial stage than in said final stage, operating said final stage at a hydrogen pressure between 1,300 and 1,900 psi and operating said initial stage at a hydrogen pressure up to 2,300 psi which is higher than the pressure in said final stage so that the ratio of percent demetallization to percent desulfurization is higher in the final stage than in the initial stage, the catalyst in said final stage comprising a higher weight percent of Group VI and Group VIII metals than the catalyst in said initial stage so that the final stage produces an effluent wherein the amount of nickel plus one-fifth the amount of vanadium is less than one part per million, the effluent from said final stage comprising more than 80 volume percent boiling above the gasoline range based on feed residual oil.

3,936,371

METHOD FOR REMOVING VANADIUM, NICKEL, AND SULFUR FROM HYDROCARBON OILS

Shigeru Ueda; Yoshinori Nakata; Shinichi Yokoyama, all of Sapporo; Naoyuki Todo, Tachikawa; Yuji Yoshida, Sapporo; Tadao Ishii, Sapporo, and Gen Takeya, Sapporo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 14, 1974, Ser. No. 451,160

Claims priority, application Japan, Mar. 30, 1973, 48-36985

Int. Cl.² C10G *17/00*, *29/04*

U.S. Cl. 208—251 H 4 Claims

1. A method for removing vanadium, nickel, sulfur and asphaltenes from hydrocarbon oils comprising contacting said hydrocarbon oil with red mud having from 18 – 25% by wt. aluminum oxide, 15 – 20% by wt. silicon dioxide, 30 – 40% by wt. ferric oxide, 2 – 8% by wt. titanium dioxide, and 8 – 12% by wt. of matter that is lost by ignition, at elevated temperatures and in the presence of hydrogen.

3,936,372

METHOD FOR BENEFICIATION OF MAGNESITE ORE

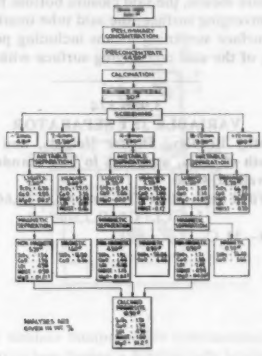
Anthony Z. Frangiskos, Athens, Greece, assignor to Financial Mining-Industrial and Shipping Corporation, Greece

Continuation of Ser. No. 307,521, Nov. 17, 1972, abandoned. This application Dec. 10, 1974, Ser. No. 531,446

Claims priority, application Greece, Nov. 24, 1971, 44504

Int. Cl.² B03B *1/02*

U.S. Cl. 209—3 13 Claims



1. A process for recovering magnesite from its ores as a caustic-calcined magnesite comprising the steps of:

calcining a particulate magnesite ore having a particle size between about 2 and about 17mm by gradually heating the ore at a temperature of from about 500°C to about 1000°C so as to gradually raise the temperature of the ore for the desired calcination thereby converting the ore into a mixture of caustic-calcined magnesite having a bulk density in range of from about 1.4 to about 1.6 g/cm³ and calcined gangue having a bulk density in the range of from about 2.2 to about 2.4 g/cm³;

subsequently separating said caustic-calcined magnesite from said calcined gangue by a physical separation process by utilizing the difference between said bulk density of the caustic-calcined magnesite and said bulk density of the calcined gangue; and

effecting said separation on said mixture without size reduction of the latter.

3,936,373

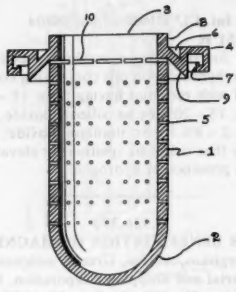
FECAL EXAMINATION DEVICE

Arnold David Studer, P.O. Box 5, West Grove, Pa. 19390

Continuation-in-part of Ser. No. 525,231, Nov. 19, 1974, abandoned, and a continuation of Ser. No. 528,585, Nov. 29, 1974, abandoned. This application July 2, 1975, Ser. No. 592,495

Int. Cl.² B03B 5/36

U.S. Cl. 209—17 5 Claims



3. In apparatus for use in the sink-or-float separation of ova from feces contained in a transport receptacle, a filter thimble combined with receptacle closure means, the closure means having a top face and a bottom face, the thimble comprising an open top, generally cylindrical tube with a bottom face, the tube carrying below its open top around its upper side surface the said closure means, the said closure bottom face having an upwardly converging surface, the said tube bearing around its lower side surface screening means including perforations at the junction of the said converging surface with said tube.

3,936,374

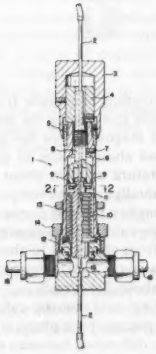
VARIABLE JET SEPARATOR

M. P. Timothy Bradley, Shaker Heights, and Jacob Shen, Akron, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sept. 30, 1974, Ser. No. 510,609

Int. Cl.² G01D 15/08

U.S. Cl. 210—31 C 5 Claims



1. A variable jet separator apparatus useful in chromatograph-mass spectrometer interfacing for coupling the effluent line of a gas or liquid chromatograph to a mass spectrometer comprising an upper capillary tube and a lower capillary tube, both of said tubes having tapered ends, the ends of said tubes being located adjacent to one another in an enclosed chamber, one of said tubes being adjustable to move towards or away from said other tube, one of said tubes being coupled to the effluent line of a gas or liquid chromatograph and the other of said tubes being coupled to a mass spectrometer.

3,936,375

PROCESS FOR DEWATERING A PROTEINACEOUS, AQUEOUS SLUDGE AND FOR REMOVING AND RECOVERING PRECIPITATING AGENTS FROM A PRECIPITATE CONTAINING PROTEINACEOUS SUBSTANCES

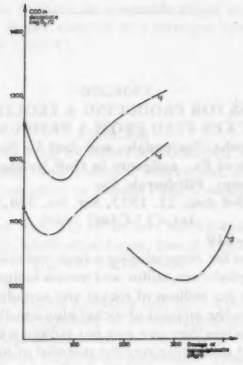
Per Nettli, Asker, Norway, assignor to A/S Apothekernes Laboratorium for Specialpraeparater, Oslo, Norway

Continuation-in-part of Ser. No. 342,798, March 19, 1973, abandoned. This application Sept. 25, 1974, Ser. No. 509,317

Claims priority, application Norway, Mar. 20, 1972, 903/72

Int. Cl.² C02B 1/20

U.S. Cl. 210—45 10 Claims



1. A process for coagulating and agglomerating a proteinaceous aqueous sludge, previously precipitated with a precipitating agent, separating said sludge from the water therein contained, and recovering the precipitating agent comprising the sequential steps of;

a. mixing said sludge with, calcium chloride

b. adjusting the pH to a value in the range of 6.5–9.5 by adding a base selected from the group consisting of alkali metal hydroxides and alkaline earth metal hydroxides,

c. heating said mixture to a temperature in the range of 60°–120°C in order to coagulate and agglomerate said sludge, whereby an aqueous phase containing the precipitating agent and a coagulated protein phase are formed, and

d. separating said aqueous phase containing the precipitating agent from said coagulated protein phase.

3,936,376

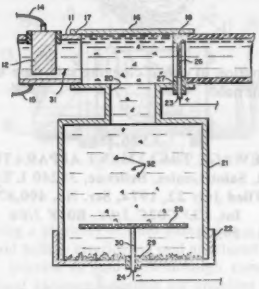
METHOD FOR COLLECTING SCALE FORMATIONS IN WATER PIPES

Philip Centineo, Camarillo, Calif., assignor to Key II Industries, Camarillo, Calif.

Continuation of Ser. No. 472,545, May 23, 1974, abandoned. This application Apr. 9, 1975, Ser. No. 566,266

Int. Cl.² B03C 5/00; B01D 35/06

U.S. Cl. 210—42 S 1 Claim



1. A method of inhibiting scale in flowing water and collecting the same comprising, in combination, the steps of:

a. subjecting said flowing water to an alternating square wave electric field to cause conglomerations of charged ions to be entrained in said flowing water;

b. thereafter confining the flowing water to a horizontal flow path;

c. positioning a first screen in a vertical plane in said flow path;

d. providing a chamber below said flow path in communication with said flow path at a point before the flowing water reaches said screen;

e. providing a second screen in an horizontal plane in said chamber;

f. charging said first screen with an electrically positive charge so that said conglomerations are repelled by said first screen and thus tend to drift downwardly into said chamber; and,

g. charging said second screen with an electrically negative charge to thereby attract said conglomerations for collection in said chamber.

3,936,377

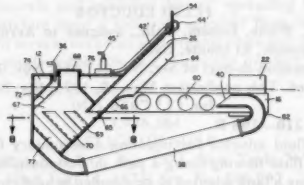
OIL SEPARATION AND RECOVERY METHOD

Frank Galicia, 5043 Catherine St., Philadelphia, Pa. 19143

Division of Ser. No. 352,209, April 18, 1973, Pat. No. 3,890,234. This application Apr. 3, 1975, Ser. No. 564,815

Int. Cl.² B01D 21/00

U.S. Cl. 210—84 9 Claims



6. A method for separating first and second liquids of different densities, said first liquid being disposed upon the surface of a body of said second liquid, comprising the steps of:

providing a plurality of parallel elongate trough structures each having a substantially inverted V-shaped cross section, said trough structures being inclined with respect to the surface of said second liquid so that the cross sections thereof open in a generally downward direction;

providing flotation means associated with said trough structures for supporting said structures in the second liquid;

propelling the trough structures through the liquids to urge the first liquid into the V-shaped cross sections and downwardly within said trough structures;

collecting the liquid urged downwardly within said trough structures within a chamber having upper and lower portions; and

transporting the liquid collected from the lower portion of said chamber to a region before said trough structures;

whereby the less dense of the liquids is accumulated in the chamber and the more dense of the liquids is discharged in advance of the trough structures to induce the advance of the less dense liquid into said structures.

3,936,378

ROTARY STRAINER

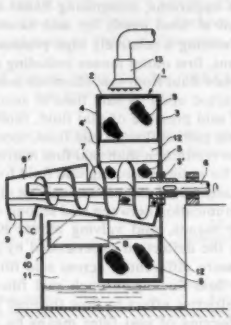
Mitsuo Kawada, Toyota, Japan, assignor to Kito Machine Industries Co. Ltd., Toyota, Japan

Filed Jan. 22, 1974, Ser. No. 435,414

Claims priority, application Japan, Jan. 23, 1973, 48-010682

Int. Cl.² B01D 33/06

U.S. Cl. 210—107 11 Claims



1. A rotary strainer comprising in combination:

a box-like structure having a substantially horizontal axis of revolution and provided with an opening at one side thereof, with a filter net being spread over the entire periphery thereof;

a screw extending through the inside of said box-like structure and protruding out of said structure from said opening thereof;

a screw conveyor chute provided below said screw and having a slant bottom face inclined downwardly toward said box-like structure;

a shaft axially connected to the screw and to the box-like structure,

wherein the screw is tapered inward from a maximum dimension near connecting means mounted on the box-like structure opposite the opening, wherein the screw closely approaches the the inclined chute, and

wherein the shaft is connected to the box-like structure and to the screw for simultaneously rotating the box-like structure and the screw,

a passage for introducing a liquid-solid mixture to be separated into said box-like structure through said opening; and

driving means connected to the shaft for rotating said box-like structure and said screw.

3,936,379

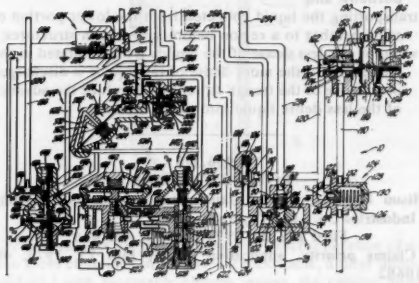
FAIL SAFE DEVICE

Ralph Patrick McCabe, Troy, Mich., assignor to Colt Industries Operating Corporation, New York, N.Y.

Division of Ser. No. 355,819, April 30, 1973. This application Aug. 12, 1974, Ser. No. 496,556

Int. Cl.² B01D *29/36*

U.S. Cl. 210—131 8 Claims



1. Fail safe apparatus, comprising house means, chamber means defined at least partly by said housing means, inlet means for admitting a relatively high pressure fluid into said chamber means, first outlet means including a first restriction for directing said fluid from said chamber means to associated means to be acted upon by said fluid in accordance with the magnitude of said pressure of said fluid, filter means situated generally in the path of flow of said fluid, second outlet means having a lesser restriction than said first restriction of said first outlet means for at times dircting said fluid from said chamber means to the associated means, and valving means for controlling the communication between said second outlet means and said chamber means, said valving means being operatively controlled by the deflection experienced by said filter means due to a pressure differential across said filter means generated by said fluid flowing through said filter means and an increasing restrictive effect to flow through said filter means created by clogging of said filter means by particles of dirt, whereby clogging of said filter in the absence of said valve would produce an undetectable, lower-than-normal pressure having an undesired effect on the associated means, as compared to said filter not being clogged, but whereby, upon said filter becoming clogged sufficiently to cause said valve to open, a higher-than-normal pressure is produced and said second outlet means, said higher-than-normal pressure being detectable and useable to have a desired effect on the associated means.

3,936,380

MEANS TO COUNTERACT A CLOGGING OF DRAIN PIPES

Johann Böske, 2849 Goldenstedt, Arkeburg, Germany

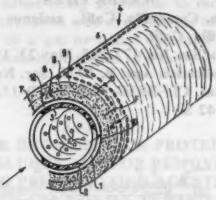
Division of Ser. No. 277,470, Aug. 2, 1972, abandoned. This application July 15, 1974, Ser. No. 488,460

Int. Cl.² C02B *5/06*

U.S. Cl. 210—170 14 Claims

1. In a drain plant having underground plastic or clay drain-pipes which have porous walls enveloped by filter material wherein local ground water is drained by radial inflow through said walls the improvement comprising,

tannin dispensing means containing tannin connected to said pipe for delivering tannin into the drain flow to convert earth components which otherwise would cause



the formation of ochre clogging said pipe into non-clogging materials.

3,936,381

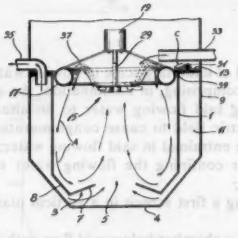
SEWAGE TREATMENT APPARATUS

Jean Pacaud, Saint-Genies, Bellevue, 31240 L'Union, France

Filed July 22, 1974, Ser. No. 490,872

Int. Cl.² C02C *5/04*; B01F *3/04*

U.S. Cl. 210—195 R 15 Claims



1. Domestic sewage water treatment apparatus, comprising:

a. an outer tank having inlet means and outlet means,

b. an inner tank disposed within and spaced from said outer tank, the bottom of said inner tank being vertically displaced from the bottom of said outer tank,

c. the bottom of said inner tank having an aperture therein and an upwardly directed means for preventing light particles from ascending into said outer tank,

d. means provided at the top of said inner tank for creating a sufficient upwards suction providing homogenization, aeration and recirculation of a bath and of activated sludge contained in said inner tank,

e. floating means provided at the top of said inner tank for acting as a protection rampart against turmoil created by the aeration, homogenization and recirculation means,

f. means provided at the top of the space between the outer tank and the inner tank for trapping light floating materials collected at the top of said space and evacuating said floating materials from said top of said space.

3,936,382

FLUID EDUCTOR

Leslie E. White, Folsom, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

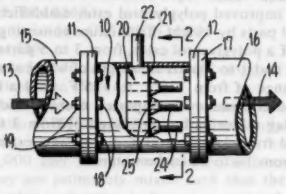
Continuation-in-part of Ser. No. 417,856, Nov. 21, 1973, abandoned. This application May 19, 1975, Ser. No. 578,929

Int. Cl.² C02B *1/20*

U.S. Cl. 210—198 R 18 Claims

1. A fluid eductor for injecting a secondary fluid into a primary fluid flowing along a path in a conduit, said eductor comprising a tank adapted to be coupled to said conduit in the path of said primary fluid, said tank having means defining a hollow interior, said means including an apertured downstream wall, an inlet pipe in fluid communication with said

interior and adapted to be coupled to a source of said secondary fluid, a flow-through conduit extending through said tank and terminating in an apertured portion downstream of said tank, said apertured portion having a plurality of apertures formed therein, and a platelet assembly surrounding said downstream portion of said flow-through conduit, said platelet



assembly having a plurality of fluid passageways in communication with said hollow interior via said apertured downstream wall and the interior of said flow-through conduit via said apertures in said apertured portion for enabling said secondary fluid to flow from said tank to the interior of said flow-through conduit and intermingle with said primary fluid downstream of said wall.

3,936,383

SOL OF ULTRA-FINE PARTICLES OF SYNTHETIC HECTORITE

Nobutoshi Daimon, No. 195-112, Aza Kanda, Mikuriya, Kawanakajima-cho, Nagano, Nagano Prefecture, and Toichiro Izawa, No. 25-26, Koganekara 7-chome, Matsudo, Chiba Prefecture, both of Japan

Filed May 6, 1974, Ser. No. 467,565

Claims priority, application Japan, May 14, 1973, 48-52531

Int. Cl.² B01J *13/00;* **H01B** *3/02;* **C01B** *33/20*

U.S. Cl. 252—63 **5 Claims**

1. A sol of ultra-fine particles of synthetic hectorite, prepared by swelling and cleaving Li-hectorite having the formula $Li_{1/3}Mg_{2-2/3}Li_{1/3}(Si_4O_{10})F_2$ or Na-hectorite having the formula $Na_{1/3}Mg_{2-2/3}Li_{1/3}(Si_4O_{10})F_2$ in water or an organic solvent, and ion-exchanging the Li or Na ions co-ordinated between the lattice layers of the hectorite with a non-hydratable cation selected from the group consisting of K^+, Ag^+, Cu^+, Ba^{2+}, Pb^{2+}, Sn^{2+}, Zn^{2+}, Al^{3+}, Bi^{3+} and Sb^{3+}.

3. A heat-resistant and insulating film-like product prepared by mixing the sol of claim **1** with a filler selected from the group consisting of organic fibers, inorganic fibers, ceramic minerals and mixtures thereof, spreading the thus-prepared mixture on a flat surface, drying it to remove the water or organic solvent therefrom and removing the film-like product from the flat surface.

5. A heat-resistant and insulating film-like composite product prepared by mixing the sol of claim **1** with a filler selected from the group consisting of organic fibers, inorganic fibers, ceramic minerals and mixtures thereof, spreading the thus-prepared mixture onto a substrate selected from the group consisting of metals, ceramics and organic films and drying the mixture to produce the film-like composite product.

3,936,384

RELIGIOUS SOAP

Yancey Williams, G.P.O. Box 1373, New York, N.Y. 10038

Filed Jan. 14, 1975, Ser. No. 540,992

Int. Cl.² C11D *17/00*

U.S. Cl. 252—90 **3 Claims**

1. A bar of soap which is embossed with religious markings.

3,936,385

DENTURE CLEANSER

Shu-Sing Cheng, Hanover Park, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 9, 1973, Ser. No. 387,075

Int. Cl.² C11D *7/54*

U.S. Cl. 252—99 **21 Claims**

1. A solid denture cleanser which on mixing with water effervesces and dissolves in the water to form a solution for soaking dentures, said cleanser comprising a dry stable mixture of a peroxygen compound which yields active oxygen on admixture with water and a chlorine compound which liberates hypochlorite chlorine on contact with water, said peroxygen compound being reactive with the components of said mixture in the presence of said water to liberate bubbles of gas effervesantly, said chlorine compound being present in amount sufficient to provide an amount of hypochlorite chlorine such that the atomic ratio of hypochlorite chlorine to active oxygen of said peroxygen compound is at least greater than about 1.1:1 whereby to provide at least about 100 ppm. of hypochlorite chlorine in water solution after oxygen formation has ceased and an alkaline material comprising a water-soluble anhydrous, alkaline salt which is sufficiently alkaline to give a pH of at least about 9.

3,936,386

DISHWASHING COMPOSITIONS CONTAINING CHLORINATED ISOCYANURATE

Duncan S. Corliss, Roselle, and James F. Pacheco, Willingboro, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 6, 1973, Ser. No. 385,843

Int. Cl.² C11D *7/56*

U.S. Cl. 252—99 **5 Claims**

1. An agglomerated dishwashing detergent composition containing by weight as its essential ingredients:

Sodium dichloroisocyanurate dihydrate	0.5–10%
A polyphosphate having an Na_2O or K_2O to P_2O_5 ratio of about 1:1 to 2:1	25–60% (anhydrous basis)
Sodium carbonate	0–60% (anhydrous basis)
A sodium silicate having a SiO_2 to Na_2O ratio of from about 2.40 to about 3.22	10–15% (total silicate solids)
Low-foaming chlorine-compatible nonionic surfactant	1–10%
Water	5–20%.

3,936,387

AZEOTROPE OF 1,2-DICHLORO-1-FLUOROETHANE AND METHANOL

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 223,779, Feb. 4, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 391,663

Int. Cl.² C11D *7/50;* **C23G** *5/02*

U.S. Cl. 252—171 **3 Claims**

1. The azeotrope of (A) 1, 2-dichloro-1-fluoroethane and (B) methanol which at substantially atmospheric pressure is characterized as about 73.5 weight percent (A) and about 26.5 weight percent (B).

3,936,388

PROCESS FOR THE PRODUCTION OF SILICON DIOXIDE ION EXCHANGERS

Klaus Unger, Darmstadt, and Karlheinz Berg, Erftstadt-Lechenich, both of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed May 25, 1973, Ser. No. 364,116
Claims priority, application Germany, May 27, 1972, 2225904
Int. Cl.² B01J 21/08, 37/02
U.S. Cl. 252—182 11 Claims

1. In a process for the introduction of benzyl groups onto the surface of silicon dioxide by reacting silicon dioxide with benzyltrichlorosilane followed by hydrolysis of the thus-introduced benzylchlorosilyl groups to benzylhydroxysilyl groups, the improvement which comprises conducting the reaction of the silicon dioxide with benzyltrichlorosilane at about 200°–300° C. in the absence of solvent, air and moisture.

3,936,389

BIS GLYCOL ESTER OF SODIUM SULFO ISOPHTHALIC ACID FROM ITS DIMETHYL ESTER

Henry L. King, and John W. McGee, both of Cary, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed June 14, 1973, Ser. No. 370,073. The portion of the term of this patent subsequent to Aug. 19, 1992, has been disclaimed.
Int. Cl.² C08G 79/00
U.S. Cl. 252—182 16 Claims

1. The process of preparing a bis glycol ester of a difunctional aromatic compound possessing one or more metallo sulfonate groups and suitable for use in a subsequent continuous or non-continuous preparation of fiber-forming cationic dyeable copolyesters by copolymerization of the bis glycol ester with a low molecular weight glycol-dicarboxylic acid prepolymer comprising reacting a dimethyl ester of a metallo sulfo dicarboxylic acid with a glycol at a mole ratio of about 4–30 of the glycol to 1 of the dimethyl ester at a temperature of about 160°–250° C and at a pressure of 0–100 psig so as to provide a solution of the bis glycol ester of the metallo dicarboxylic acid containing 20–75% of the bis glycol ester and having a carboxyl plus carboxylate content of not more than about 200μeq/g of bis glycol ester and no more than about 10 weight percent of glycol ether based on the bis glycol ester

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3,936,390

THERMOPHOSPHOR BASED ON LITHIUM FLUORIDE

Lidiya Semenovna Druskina, Nevsky prospekt 150, kv. 93, and Iosif Khaimovich Shaver, prospekt Smirno-va, 59, kv. 153, both of Leningrad, U.S.S.R.

Filed June 20, 1973, Ser. No. 371,695
Claims priority, application U.S.S.R., June 27, 1972, 1801804
Int. Cl. C09k 1/06
U.S. Cl. 252—301.4 H 3 Claims

1. A lithium fluoride thermophosphor, consisting essentially of lithium fluoride, from about 0.5 to about 3 weight percent of calcium and from about 0.015, to about 0.1 weight percent of cerium said phosphor exhibiting an ultraviolet thermoluminescent spectrum.

3,936,391

HYDRATED POLYGLYCEROL ESTER COMPOSITION

John Lester Gabby; Dennis Dale Corbin, and Jack Bruner Lowe, all of Evansville, Ind., assignors to Drackett Company, Cincinnati, Ohio

Division of Ser. No. 153,837, June 16, 1971, Pat. No. 3,809,764, which is a continuation-in-part of Ser. No. 74,211, Sept. 21, 1970, abandoned. This application Feb. 13, 1974, Ser. No. 442,015
Int. Cl.² B01F 17/34
U.S. Cl. 252—356 9 Claims

1. An improved polyglycerol ester emulsifier prepared by heating 9 parts by weight of a mixture consisting of 3 parts by weight of a polyglycerol ester, from 3 to 5 parts by weight of glycerol, and 1 to 3 parts by weight of water at a temperature in the range of from 125°F. to 135°F. until a homogeneous paste-like consistency is imparted thereto said polyglycerol ester being molecularly constituted of from 3 to 10 glycerol units and from 1 to 2 saturated fatty acyl ester groups each having from 16 to 20 carbon atoms.

3,936,392

ANTI-CAKING OF POTASSIUM BISULFATE AND RESULTING COMPOSITIONS

Walter Edmund Steinmetz, Shreveport, La., assignor to Pennzoil Company, Shreveport, La.

Filed Jan. 17, 1974, Ser. No. 434,204
Int. Cl.² C09K 3/00; C05B 17/00
U.S. Cl. 252—385 8 Claims

1. A method for inhibiting caking of a mixture consisting essentially of potassium bisulfate during storage periods in excess of 24 hours which consists essentially of adding thereto and mixing therewith about 0.5 to 20.0 weight percent of finely ground phosphate rock at a temperature of about 30°–150°C. to form a mixture consisting essentially of potassium bisulfate mixed with phosphate rock wherein during the storage period there is formed a generally uniform anti-hygroscopic coating on the potassium bisulfate particles, said coating comprising the reaction product of potassium bisulfate and phosphate rock.

6. A storage stable composition of matter consisting essentially of potassium bisulfate admixed with about 0.5 to 20.0 weight percent of phosphate rock and containing a reaction product of potassium bisulfate and phsophate rock as a generally uniform anti-hygroscopic coating on the bisulfate particles, said reaction product being formed during a storage period.

3,936,393

ANTIMICROBIAL AGENTS AND USE THEREOF

Leonard Jurd, Berkeley; A. Douglas King, Jr., Martinez, and William L. Stanley, Richmond, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 74,485, Sept. 22, 1970, Pat. No. 3,745,222. This application Apr. 17, 1973, Ser. No. 351,933
Int. Cl.² C09K 15/08, 15/34; A01N 9/00; A23L 3/00
U.S. Cl. 252—404 2 Claims

1. A composition of matter comprising -

a. a major proportion of a substance normally subject to microbial spoilage, and

b. a minor proportion, sufficient to inhibit microbial growth, of 2-methoxy-4-cinnamyl-phenol.

3,936,394

POLYMER ADSORBENTS AND METHOD FOR MANUFACTURE THEREOF

Tetsuhiro Kusunose; Tatsuo Ishikawa; Norio Akimoto; Noboru Fukuma, and Kazuyoshi Imamura, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1973, Ser. No. 349,464

Claims priority, application Japan, Apr. 13, 1972, 47-36422; Aug. 28, 1972, 47-85395; Sept. 12, 1972, 47-90974; Jan. 26, 1973, 48-10263

Int. Cl.² B01J *31/02*

U.S. Cl. 252—430 **16 Claims**

1. A method of producing an adsorbent composed of microfibrils, comprising the steps of

a. mixing two synthetic polymer components A and B in a mixing ratio of 20/80 – 80/20, both of said polymer components having a number average molecular weight of at least 10,000 and being incompatible with each other when they are intimately mixed such that they remain undissolved in each other to form a separate phase when they are mixed and molded under heat,

b. subjecting the mixture in molten state to an extrusion molding to shape the article in the form of threads, ropes or films where polymer A forms microfibrils, said molding being done at a draft ratio of 1.0 – 10.0 and thereafter,

c. treating the shaped article with a solvent which is incapable of dissolving or decomposing the polymer A but capable of dissolving or decomposing the other constituent polymer B.

3,936,395

NONACIDIC MULTIMETALLIC DEHYDROGENATION CATALYST

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 365,877, June 1, 1973, Pat. No. 3,856,870, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Apr. 8, 1974, Ser. No. 458,607

Int. Cl.² B01J *21/04, 23/56*

U.S. Cl. 252—466 PT **8 Claims**

1. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to 2 wt. % iridium, about 0.01 to about 5 wt. % germanium and about 0.1 to about 5 wt. % of an alkali or alkaline earth metal, wherein the platinum or palladium, iridium, germanium and alkali or alkaline earth metal components are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and iridium components are present in the corresponding elemental metallic state, wherein substantially all of the germanium component is present in the oxidation state above that of the elemental metal and wherein substantially all of the alkali or alkaline earth metal component is present in an oxidation state above that of the elemental metal.

3,936,396

VOLTAGE VARIABLE RESISTOR

Takeshi Masuyama, Takatsuki; Mikio Matsuura, Neyagawa; Yoshio Iida, Suita, and Toshioki Amemiya, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

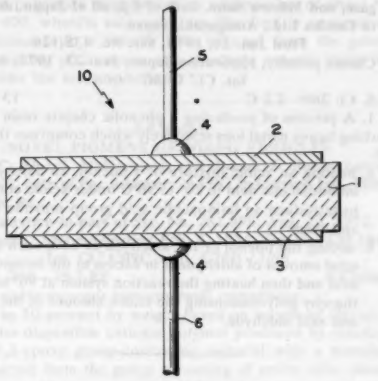
Filed Apr. 17, 1970, Ser. No. 29,416

Claims priority, application Japan, May 2, 1969, 44-34928

Int. Cl.² H01B *1/06*

U.S. Cl. 252—518 **4 Claims**

1. A voltage variable resistor comprising a sintered body consisting essentially of, as a major part, zinc oxide and an additive consisting essentially of 0.1 to 3.0 mole % of bismuth oxide and one member selected from the group consisting of 0.1 to 1.0 mole % of aluminum fluoride, 0.5 to 1.0 mole % of beryllium fluoride, 0.5 to 1.0 mole % of cerium fluoride, 0.5 to 2.5 mole % of nickel fluoride, and 1.0 to 2.0 mole % of



vanadium fluoride, and electrodes applied to opposite surfaces of said sintered body.

3,936,397

SEMICONDUCTIVE GLASS-CERAMIC ARTICLES

James E. Rapp, Oregon, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 1, 1974, Ser. No. 438,567

Int. Cl.² H01B *1/06, 3/02, 3/08*

U.S. Cl. 252—518 **10 Claims**

1. A semiconductive, glass-ceramic body having a resistivity of less than about 10^9 ohm-cm at 25°C prepared by the in-situ, thermal crystallization of a thermally crystallizable glass composition consisting essentially of:

Component	Mole %
CdO	50.0–62.0
Bi_2O_3	17.5–29.0
B_2O_3	15.2–19.5
GeO_2	2.0–6.0

said B_2O_3 and GeO_2 being present in the following mole % relationship:

A. when B_2O_3 is 15.2 to <16.5 then GeO_2 is 3.5 to 6.0
B. when B_2O_3 is 16.5 to <17.5 then GeO_2 is 2.0 to 6.0
C. when B_2O_3 is 17.5 to 19.5 then GeO_2 is 2.0 to 4.0.

3,936,398

IMPROVING THE ODOR OF PERFUME BY NOVEL CYCLIC KETAL

Robert F. Tavares, Cedar Grove, N.J.; Jack Agran, Brooklyn, N.Y., and William M. Easter, Hasbrouck Heights, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 341,628, March 15, 1973. This application May 15, 1974, Ser. No. 470,244

Int. Cl.² A61K *7/46*; C11B *9/00*; C07D *321/06*

U.S. Cl. 252—522 **5 Claims**

1. A method for improving the odor of perfume compositions which comprises adding thereto a proportion of 4,7-dihydro-2-isopentyl-2 -methyl-1,3-dioxepin.

3,936,399
PROCESS OF PRODUCING PHENOLIC CHELATE RESIN USING IMINODIACETIC ACID

Masahide Hirai, Uji; Mikio Fujimura, Kamo; Masahiro Kazigase, and Minoru Saito, both of Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Jan. 21, 1974, Ser. No. 435,126
Claims priority, application Japan, Jan. 23, 1973, 48-9793
Int. Cl.² C08G *14/06*
U.S. Cl. 260—2.2 C **13 Claims**

1. A process of producing a phenolic chelate resin for adsorbing heavy metal ions selectively which comprises the steps of:

a. heating an acidic mixture of a phenol, an aldehyde and iminodiacetic acid to 20° to 90°C under acidic conditions to introduce an iminoacidic acid group into the phenol; and then

b. adding the phenol or the aldehyde or both such that the total amount of aldehyde is in excess to the iminodiacetic acid and then heating the reaction system at 90° to 110°C thereby polycondensing the entire amount of the phenol and said aldehyde.

3,936,400
FLAME RETARDANT FOAMED POLYESTER COMPOSITIONS

Allen D. Wambach, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 233,754, March 10, 1972, Pat. No. 3,833,685. This application July 5, 1974, Ser. No. 486,213. The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.
Int. Cl.² C08J *9/06*; C08L *69/00*
U.S. Cl. 260—2.5 N **21 Claims**

1. A flame retardant composition comprising from 90 to 10 parts by weight of a resinous composition which comprises:

a. a normally flammable high molecular weight polyester and a flame-retardant amount of from 0.5 to 50 parts by weight per 100 parts by weight of the resinous components of

b.

i. an aromatic carbonate copolymer in which from 25 to 75 wt.% of the repeating units comprise chloro- or bromo-substituted dihydric phenol units and the remainder of the repeating units comprise dihydric phenol, glycol or dicarboxylic acid units;

ii. an aromatic carbonate homopolymer in which the repeating units comprise chloro- or bromo-substituted dihydric phenol units in combination with an aromatic carbonate homopolymer comprising dihydric phenol units; or

iii. a combination of (i) with an aromatic carbonate homopolymer comprising dihydric phenol units, in combination with

c. about 0.5 to about 20 parts by weight per 100 parts of combined resinous components in the composition; an inorganic or organic antimony-containing compound; and

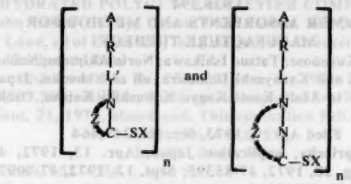
d. a foaming agent.

3,936,401
NOVEL POLYMERIC DERIVATIVES OF TETRAZOLE-5-HIOLS AND THEIR METAL AND AMMONIUM SALTS

J. Michael Grasshoff, Hudson, and Jerome L. Reid, Wayland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 429,900, Jan. 2, 1974, abandoned. This application Nov. 5, 1974, Ser. No. 520,983
Int. Cl.² C08L *89/00*
U.S. Cl. 260—8 **17 Claims**

1. A compound selected from:



wherein A is an ethylenically unsaturated substituent which has been polymerized, R is a resonance stabilized group, L′ is an optional linking group, X is hydrogen, ammonium or metal, Z represents the atoms and bonds necessary to complete a tetrazole ring and *n* is an integer of at least 100.

2. A compound of claim 1 wherein X is ammonium, or monovalent metal.

14. A composition comprising gelatin and a compound of claim 2.

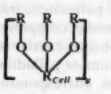
3,936,402
ANHYDROUS PRODUCTS HAVING IMPROVED WETTABILITY CHARACTERISTICS, CASE 5

James J. Keegan, Bloomfield; Girish Patel, Mine Hill, and Howard Rubin, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

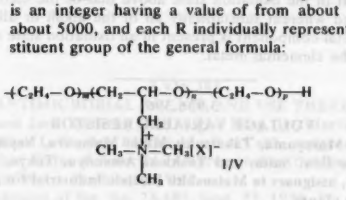
Continuation-in-part of Ser. No. 302,162, Oct. 30, 1972, Pat. No. 3,878,138. This application Dec. 9, 1974, Ser. No. 530,579
Int. Cl.² C08L *1/28*
U.S. Cl. 260—17 R **5 Claims**

1. A denture adhesive powder having superior wettability characteristics comprises a substantially anhydrous mixture of nontoxic, adhesive ingredients and from about 40% to about 60% by weight, based on the total weight of the denture adhesive ingredients of a powdered polymeric material having an average particle size of less than about 422 microns, said polymeric material being selected from the group consisting of powdered polyethylene having an average molecular weight ranging from about 1000 to about 3500 and polypropylene having an average molecular weight ranging from about 120,000 to about 350,000, said denture adhesive ingredients comprising:

A. from about 5 to about 55% by weight, based on the total weight of the denture adhesive ingredients of at least one cationic polymeric material having the formula:



wherein R_{Cell} is the residue of an anhydroglucose unit, *y* is an integer having a value of from about 1000 to about 5000, and each R individually represents a substituent group of the general formula:



wherein:

m is an integer having a value of from zero to 10;

n is an integer having a value of from zero to 3;

p is an integer having a value of from zero to 10;

X is an anion; V is an integer which is equal to the valence of X; the average value of *n* per anhydroglucose unit of said cellulose ether is from about 0.01 to about 1; and the average value to *m*+*p* per anhydroglucose unit of said cellulose ether is from about 0.01 to about 4; and

B. from about 5% to about 55% by weight, based on the total weight of the denture adhesive, of at least one anionic gum selected from the group consisting of copolymers of maleic acid with vinyl-lower alkyl-ether wherein the alkyl group has from 1 to 5 carbon atoms.

3,936,403

SYNTHETIC RESIN COMPOSITION

Fumio Sakaguchi, Yokohama; Kenji Takemura, Kawasaki; Tadao Suzuki, Fujisawa; Isamu Yamazaki, Oita; Yoshifumi Nishibayashi, Sennan; Kazunobu Shiozawa, Izumisano, and Toshimitsu Sasaki, Sennan, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo and Toyo Cloth Co., Ltd., Sennan, both of, Japan

Filed May 1, 1974, Ser. No. 466,048
Claims priority, application Japan, May 7, 1973, 48-49828
Int. Cl.² C08K *3/22*; C08L *91/00*
U.S. Cl. 260—23 XA 8 Claims

1. A synthetic resin composition capable of forming moldings with good surface hardness and flame resistance consisting essentially of 20 to 50 parts by weight of olefinic resin, 10 to 40 parts by weight of vinyl chloride resin and 70 to 10 parts by weight of alumina trihydrate of the formula α-$Al(OH)_3$ with a gibbsite crystal structure in which the lattice constant is measured as $a = 8.62A$, $b = 5.06A$ and $c = 9.70A$, the β (B) angle is determined to be 85°26′ and the refractive index is expressed as $\alpha = 1.568$, $\beta = 1.568$ and $\gamma = 1.567$ and which has an average particle size under 30 microns, said olefinic resin being selected from the group consisting of ethylene homopolymer, copolymers formed of at least 80 mol% ethylene and not over 20 mol% of other α-olefin, propylene homopolymers and copolymers formed of at least 80 mol% propylene and not over 20 mol% of other α-olefin or diolefin, and said vinyl choride resin being selected from the group consisting of vinyl chloride polymer and mixtures thereof with up to 120 parts by weight of plasticizer, up to 10 parts by weight of lubricant and up to 10 parts by weight of stabilizer per 100 parts of vinyl chloride polymer, said vinyl chloride polymer having a degree of polymerization between about 850 to 1,800 and being selected from the group consisting of vinyl chloride homopolymer and copolymers formed of at least 85 mol% vinyl chloride with ethylene, vinylidene chloride, vinyl acetate or acrylic ester.

3,936,404

AQUEOUS BAKING VARNISHES FROM CARBOXYLIC POLYESTER AND CARBOXYLIC POLYIMIDE, AND COATED ARTICLE

Takashi Ishizuka, and Naoki Miwa, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 19, 1974, Ser. No. 498,673
Claims priority, application Japan, Aug. 17, 1973, 48-92831
Int. Cl.² B32B *15/08*; C08L *79/08*
U.S. Cl. 260—29.2 N 15 Claims

1. An aqueous baking varnish having a low viscosity and a high concentration suitable for coating conductors which comprises

A. a carboxyl group containing polyester resin having an acid number of about 10 to 150 comprising the reaction product of

1. an organic carboxylic acid component comprising
   a. about 15 to 100 mol% of at least one of an aromatic tricarboxylic acid and the anhydride thereof in which up to 30 mol% of the aromatic tricarboxylic acid and the anhydride thereof can be replaced by at least one of an aromatic tetracarboxylic acid and the anhydride thereof, and
   b. about 0 to 85 mol% of at least one of a dicarboxylic acid and the anhydride thereof; and
2. an organic alcohol component comprising at least one organic polyhydric alcohol, the molar ratio of the carboxyl group content in the organic acid component to the hydroxyl group content in the organic alcohol component ranging from about 1:1 to 1:3;

B. a polyimide resin comprising the reaction product of 1,2,3,4-butanetetracarboxylic acid and/or an imide-forming derivative thereof, and at least one organic diamine said polyimide resin having an acid number of about 50 to 400, wherein said resins are dissolved in an aqueous solution with a volatile base selected from the group consisting of ammonia and a volatile organic amine to render the resins soluble.

3,936,405

NOVEL PIGMENT GRINDING VEHICLES

Lance C. Sturni, McKeesport, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 281,098, Aug. 16, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,184
Int. Cl.² C09C *3/10*; C25D *13/06*
U.S. Cl. 260—29.2 EP 6 Claims

1. A stable aqueous pigment paste comprising:

A. 2 to 50 percent by weight based on weight of (B) of a water-dispersible cationic polymer produced by reacting a 1,2-epoxy group-containing material with a material selected from the group consisting of amine salts, phosphine-acid mixtures and sulfide-acid mixtures, said cationic polymer having a ratio of final quaternary onium salt groups to initial epoxide groups greater than about 0.4 to 1; and

B. a pigment dispersed therein.

3,936,406

STABLE EMULSIONS

Pat F. Rion, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1974, Ser. No. 449,641
Int. Cl.² C08L *7/02*, *11/02*, *15/02*
U.S. Cl. 260—29.7 GP 6 Claims

1. A friction- and storage-stable oil-in-water emulsion concentrate having a pH in the range of 1 to 3.5 and having an oil phase and a water phase and wherein said water phase constitutes from about 25 to 60 weight percent of the total emulsion, wherein said oil phase contains from 2 to 40 weight percent elastomer taken from the group consisting of natural rubber, butadiene styrene copolymers, SBR block copolymers, cis-polyisoprene and trans-polyisoprene dissolved therein, wherein said oil phase is formed of an aromatic oil having an aromatic content of at least 50 percent and a viscosity below about 50 SUS at 210° F. and wherein said emulsion contains a cationic or nonionic emulsifier.

3,936,407

COATED METAL FASTENERS

Robert E. Parkinson, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 295,076, Oct. 4, 1972, Pat. No. 3,853,606, which is a division of Ser. No. 107,864, Jan. 19, 1971, abandoned. This application Sept. 23, 1974, Ser. No. 508,494
Int. Cl.² C08L *93/00*
U.S. Cl. 260—27 R 3 Claims

1. A coating composition particularly useful for coating on nails comprising an emulsified mixture of:

a. from about 50 to about 80 percent by weight of resin solids of rosin or a rosin-like resin which melts at a temperature of from about 60°C to about 150°C, dissolved in an organic solvent; and

b. from about 20 to about 50% by weight of resin solids of an ethylene copolymer or terpolymer comprising from about 60 to about 90 percent by weight ethylene and from about 10 to about 40 percent by weight of an ethylenically unsaturated carboxylic acid or an ester thereof free of groups which are reactive of said rosin or rosin-

like resin, said ethylene copolymer or terpolymer dissolved in a hot volatile aqueous alkali solution.

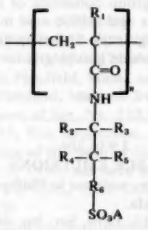
3,936,408

WELL CEMENTING COMPOSITION HAVING IMPROVED FLOW PROPERTIES CONTAINING A POLYAMIDO-SULFONIC ADDITIVE

Sally L. Adams, Pittsburgh; Michael M. Cook, Boxford, Mass., and Fred David Martin, McMurray, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed May 1, 1974, Ser. No. 465,936
Int. Cl.² C08K 3/00
U.S. Cl. 260—29.6 S 9 Claims

1. A cementing composition comprising hydraulic cement in admixture with from about 0.01 to about 5.0 percent by weight, based on weight of hydraulic cement, of a polyamido-sulfonic compound recurring units represented by the following formula:



wherein R_1 is hydrogen or methyl; R_2, R_3, R_4, and R_5 are each independently selected from the group consisting of hydrogen, phenyl, straight or branched alkyl of from one to twelve carbon atoms, and cycloalkyl of up to six carbon atoms; R_6 is straight or branched alkyl of from one to twelve carbon atoms, cycloalkyl of up to six carbon atoms, phenyl, or is absent; A is hydrogen, alkali metal ion or ammonium; and n is an integer of from 2 to about 100, such that the weight average molecular weight of the polyamido-sulfonic compound is from about 200 to about 10,000.

3,936,409

UREA-URETHANE COMPOSITIONS AND FILMS PREPARED THEREFROM

Herbert M. Schroeder, and Paul C. Stievater, both of Williamsville, N.Y., assignors to Textron, Inc., Providence, R.I.

Continuation of Ser. No. 805,813, March 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 791,202, Nov. 4, 1968, abandoned, which is a continuation of Ser. No. 650,181, June 30, 1967, abandoned. This application Aug. 2, 1971, Ser. No. 168,463
Int. Cl.² C08G 18/06; C08K 5/05, 5/20, 5/34
U.S. Cl. 260—30.2 15 Claims

1. A urea-urethane composition of urethane prepolymer of 1-isocyanato-3-isocyanatomethyl-3,5,5-trimethyl cyclohexane and aliphatic, hydroxy-terminated polyester polyol having a molecular weight of at least about 500, and a substantially stoichiometric amount of cycloaliphatic polyamine, said urethane prepolymer having a free isocyanate content of about 1 to 15 weight percent based on urethane solids.

3,936,410

TRIARYL PHOSPHATE ESTER PLASTICIZERS FOR POLYVINYL CHLORIDE COMPOSITIONS

F. Lee Terhune, Westport, Conn., and Gordon A. Rampy, Nitro, W. Va., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 404,380, Oct. 9, 1973, Pat. No. 3,859,395. This application Sept. 23, 1974, Ser. No. 508,341
Int. Cl.² C08J 3/18; C08K 5/51
U.S. Cl. 260—30.6 R 1 Claim

1. A plasticized polyvinyl chloride composition containing 5 to 150 parts by weight of plasticizer per 100 parts of vinyl chloride polymer, wherein said plasticizer is a triaryl phosphate ester of the formula $(RO)_3PO$ wherein R represents radicals consisting essentially of:

a. at least 90% by weight monoisopropylphenyl radicals with the proviso that at least 80% by weight are a mixture of meta- and para- monoisopropylphenyl radicals, said mixture containing at least 50 to 90% by weight meta-isopropylphenyl radicals, based on the weight of said mixture;

b. 0 to 5% by weight phenyl radicals; and

c. 5 to 10% by weight di- or tri-isopropylphenyl radicals.

3,936,411

CROSSLINKED POLYVINYL CHLORIDE FILM

Ernest A. Hahn, Plainfield, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 211,640, Dec. 23, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,403
Int. Cl. C08f 15/08, 45/44; C07c 69/54
U.S. Cl. 260—32.6 R 4 Claims

1. A coating composition curable by ionizing irradiation consisting essentially of

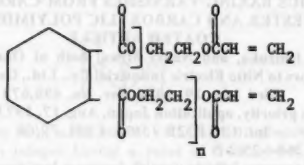
a. at least about 20 percent by weight of a solution of a chloride polymer in an active solvent for said polymer, wherein

(1) said polymer contains at least about 90 percent by weight of chloride, and

(2) said solution comprises from about 10 percent to about 30 percent by weight of said polymer and

b. from about 5 percent to about 80 percent by weight of a mixture of acrylic hexahydrophthlate compounds wherein

(1) each of said acrylic hexahydrophthalate compounds has the formula



wherein *n* is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10, and

(2) said mixture contains said acrylic hexahydrophthalate compounds having said formula wherein *n* is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10.

3,936,412

THERMOSETTING SEALING MATERIALS

Martin-Gottfried Rocholl, Heidelberg, Germany, assignor to Teroson GmbH, Heidelberg, Germany

Filed Sept. 23, 1974, Ser. No. 508,636
Claims priority, application Germany, Oct. 18, 1973, 2352272
Int. Cl.² C08L 81/00, 75/00
U.S. Cl. 260—37 R 7 Claims

1. A thermosetting sealing composition especially adapted for curing in a high frequency alternating electric field, said

composition comprising a thermosetting resinous sealant to which has been added electrically nonconducting pigments and/or fillers whose dielectric constant ϵ exceeds 200 in an amount sufficient to accelerate the thermosetting of said resinous sealant.

3,936,413

GLASS REINFORCED THERMOPLASTIC MOLDING MATERIAL CONTAINING ZINC SULFIDE PIGMENT

Rolf Würmb, Heidelberg; Raymond Denni, Ludwigshafen; Hans-Georg Dorst, Altrip, and Rudolf Ilgemann, Hohensachsen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 31, 1973, Ser. No. 365,735

Claims priority, application Germany, June 2, 1972, 2226932

Int. Cl.² C08K *5/37, 7/14*

U.S. Cl. 260—40 R 1 Claim

1. Thermoplastic molding material which comprises a mixture of

a. a plastic selected from the group consisting of polyamide and polybutylene terephthalate; and

b. from 10 to 60% by weight based on the weight of the molding material of glass fibers, said mixture further containing a pigmenting amount of

c. zinc sulfide the amount of said zinc sulfide being from 1 to 2% by weight, based on the weight of the thermoplastic material.

3,936,414

FLAME-RETARDANT RESIN COMPOSITIONS

Carl Leonard Wright, Pasadena, and Harry Hoyt Beacham, Severna Park, both of Md., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 837,911, June 30, 1969, abandoned. This application Dec. 4, 1970, Ser. No. 95,418

Int. Cl.² C08L *71/04*

U.S. Cl. 260—40 R 7 Claims

1. A thermosetting composition comprising:

1. 10 to 50 parts by weight of a polyunsaturated monomer;

2. 5 to 30 parts by weight of a polychlorinated or polybrominated aromatic hydrocarbon containing at least 50% by weight chlorine or bromine and having a molecular weight of at least 200;

3. 20 to 60 parts by weight of a polyphenylene ether polymer;

4. 0–30 parts by weight of a polyunsaturated polymer having carbon to carbon unsaturation and

5. 2–10 parts by weight per 100 parts of all of (1) plus (2) plus (3) plus (4) of a peroxide catalyst which has a 10 hour half-life in benzene at a temperature in excess of 100°C.

3,936,415

OXIDIZED POLYOLEFIN-HIGH MOLECULAR WEIGHT ELASTOMERIC MIXTURE

Thomas A. Coakley, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 6, 1974, Ser. No. 467,182

Int. Cl.² C08K *9/06*

U.S. Cl. 260—42.15 15 Claims

1. A method of bonding a polyolefin to glass fibers comprising: preparing a liquid mixture of oxidized polyolefin and a carboxylated high molecular weight elastomer having a solubility parameter similar to that of the oxidized polyolefin, coating glass fibers with said mixture, drying the coating to form a film of oxidized polypropylene having high molecular weight molecules of the elastomer therein, and embedding the coated fibers in the matrix of the polyolefin to be reinforced.

3,936,416

NONBURNING, NONDRIPPING, CHAR-FORMING, POLYPROPYLENE COMPOSITION

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 24, 1973, Ser. No. 382,169

Int. Cl.² C08F *6/00*

U.S. Cl. 260—42.18 10 Claims

1. A flame retarded, nonburning, nondripping, char-forming composition of polypropylene containing a flame retarding amount of a mixture of ammonium polyphosphate and dipentaerythritol where every 100 parts of polypropylene contain about 10 to 70 parts ammonium polyphosphate and about 5 to 30 parts dipentaerythritol with the total amount of the two additives being between about 30 and 90 parts.

3,936,417

COILABLE POLYVINYL CHLORIDE PRODUCTS AND METHODS AND COMPOSITIONS FOR PRODUCING THE SAME

Clifford Paul Ronden, Edmonton, Canada, assignor to Grandview Industries, Limited, Rexdale, Canada

Continuation-in-part of Ser. No. 746,737, July 23, 1968, abandoned, which is a continuation-in-part of Ser. No. 656,057, July 26, 1967, abandoned. This application June 5, 1970, Ser. No. 43,944

Int. Cl.² C08L *23/28, 27/06, 55/02;* B29D *23/04*

U.S. Cl. 260—42.45 8 Claims

1. As a product of manufacture, coilable polymeric pipe, capable of being installed under ground by being plowed in and suitable for natural gas transmission at low ambient temperatures, in the form of a continuous tubular body of a homogeneous fusion blend comprising

polyvinyl chloride having a Fikentscher K-value of 60–80 as determined in 1% cyclohexanone at 25°C.;

chlorinated polyethylene in an amount equal to 4–12% of the weight of said polyvinyl chloride, said chlorinated polyethylene having a chlorine content of 30–55% by weight and a melt viscosity in poises/1000 of 20–30; an additional polymeric material as a processing aid-secondary modifier in an amount equal to 0.5–6% of the weight of said polyvinyl chloride, having a heat distortion temperature of at least 155°F., and selected from the group consisting of methyl methacrylate homopolymer; copolymers of methyl methacrylate and lesser amounts of a lower alkyl acrylate; mixtures of said homopolymer and copolymers; acrylonitrile-butadiene-styrene copolymers containing 20–30% by weight acrylonitrile, 15–30% by weight butadiene and 40–65% by weight styrene; mixtures of said acrylonitrile-butadiene-styrene copolymers with lesser amounts of at least one additional polymeric material selected from the group consisting of said methyl methacrylate homopolymer and copolymers and ethylene-vinyl acetate copolymers containing 10–30% by weight vinyl acetate; copolymers of vinyl chloride with an alkyl vinyl ether in which the alkyl group contains 8–18 carbon atoms, said copolymers containing 60–99.5% by weight vinyl chloride and 0.5–40% by weight alkyl vinyl ether; and polymers produced by grafting vinyl chloride onto an ethylene-vinyl acetate copolymer to produce a polymer containing 40–60% by weight ethylne-vinyl acetate; and a minor proportion of a finely divided inorganic filler selected from the group consisting of titanium dioxide and zinc oxide,

the amount of said filler being in the range of 0.25–1% for titanium dioxide and 0.5–2% for zinc oxide, based on the weight of said polyvinyl chloride;

said pipe having

an impact strength at 0°C. of at least 85 ft. lbs. as determined for 2 inch O.D. pipe by the ASTM TUP drop test,

an apparent tensile strength of at least 7000 p.s.i. as determined by Canadian Standards Association test CSA B1374--Plastic Pipe for Gas Service, Item 5.5, and a heat distortion temperature of at least 155°F. as determined by ASTM D648-56 at 264 p.s.i.,

said pipe being sufficiently flexible to be coiled into coils of 4 feet dia., for ½ inch O.D. pipe, and 8 feet dia., for 2 inch O.D. pipe, and uncoiled from such coils at 0°F., without damage to the pipe.

3,936,418

BENZOTRIAZOLE ORTHO-ESTER ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

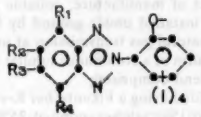
David Martin Pond, and Richard Hsu-Shien Wang, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,565
Int. Cl.² C08K 5/34
U.S. Cl. 260—45.8 NT 40 Claims

1. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amount of a composition of matter comprising polychromophoric compounds having the formula:

$(A)_x-C$

wherein A is a group having the structure



wherein

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, cyano, carboxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

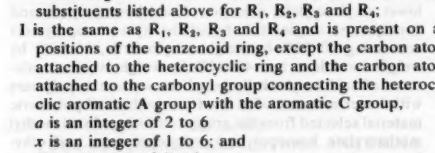
I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the carbonyl group connecting the heterocyclic aromatic A group with the aromatic C group,

a is an integer of 2 to 6

x is an integer of 1 to 6; and

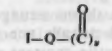
C is one of the following:

1. An aromatic group having the formula:



wherein I is the same substituent as listed above and is present in all positions of the benzenoid ring except the carbon atom attached to the carbonyl group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents; or

2. An aliphatic group having the formula



wherein Q is substituted or unsubstituted acyclic, cyclic or polycyclic aliphatic moiety containing 1 to 18 carbons.

I may be a hydrogen, hydroxy, halogen, cyano, C_1-C_{18} substituted or unsubstituted alkyl, amino, alkylamino, dialkylamino, arylamino, diarylamino, alkoxy, aryl or aryloxy group; y is an integer between 2 and 6.

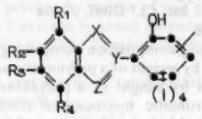
3,936,419

MULTICHROMOPHORIC ULTRAVIOLET STABILIZERS AND THEIR USE IN ORGANIC COMPOSITIONS

Richard H. S. Wang, and Gether Irick, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,570
Int. Cl.² C08K 5/10, 5/12, 5/15
U.S. Cl. 260—45.8 N 16 Claims

1. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amount of a composition of matter comprising a compound having the formula (A-B_n-C wherein A is a heterocyclic group having the structure



wherein

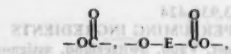
X and Y are a carbon atom or a nitrogen atom;

Z is an oxygen atom, a sulfur atom, a nitrogen atom, or a nitrogen atom containing a hydrogen atom or an unsubstituted or substituted lower alkyl group having 1 to 12 carbon atoms or an aryl group or substituted aryl group having 6 to 18 carbon atoms;

R_1, R_2, R_3 and R_4 are hydrogen, fluoro, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, alkoxy, aryloxy, substituted amino, cyano, carboalkoxy and the substituents R_1 and R_2, R_2 and R_3, R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

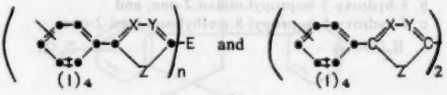
I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the Y substituent and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, said B connecting group is attached to the benzenoid ring in the ortho, meta or para positions from the carbon atom connected to the Y substituent, said I substituents can all be one of the substituents listed above or different listed substituents;

B is a linking group connecting A and C and can have the structure



where E is lower alkylene or substituted lower alkylene;

The C group is a heterocyclic group having the structures



wherein

X and Y are a carbon atom or a nitrogen atom; Z is an oxygen atom, a sulfur atom, a nitrogen atom, or a nitrogen atom containing a hydrogen atom or a substituted or unsubstituted lower alkyl group having 1 to 12 carbon atoms; I is hydrogen, fluoro, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, aryloxy, substituted amino and cyano; I is present on all positions of the benzenoid ring, except the carbon atom attached to the Y substituent and the carbon atom attached to B group; E is a substituted or unsubstituted, branched or unbranched alkylene containing 1 to 12 carbon atoms or arylene containing 6 to 18 carbon atoms; n is an integer from 1 to 6.

3,936,420

THERMALLY STABLE, NONBURNING, NONDRIPPING, CHAR FORMING POLYOLEFIN FORMULATIONS

Roy A. Gray, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 24, 1973, Ser. No. 382,170

Int. Cl.[2] C08G *6/00*

U.S. Cl. 260—45.8 NT **7 Claims**

1. A method for producing a thermally stable, nonburning, nondripping, char forming polyolefin composition which can be molded with little or no undesirable void formation therein due to gas or foam formation resulting from heating together an admixture consisting essentially of a polyolefin and an additive system of ammonium polyphosphate, dipentaerythritol, and melamine composited with the polyolefin to give it the recited properties which comprises degassing such a composition by heating at an elevated temperature above about 450°F for a period of time sufficient to disengage therefrom gas which otherwise would be formed when molding the composition, and molding the degassed composition into a molded article substantially free of undesirable voids.

3,936,421

PROCESS OF PREPARING POLYTETRAMETHYLENE TEREPHTHALATE

Masahiko Hayashi; Hiroyuki Ikeuchi, and Michihiko Tanaka, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 13, 1974, Ser. No. 523,362

Claims priority, application Japan, Nov. 19, 1973, 48-129150

Int. Cl.[2] C08G *63/14*; C08K *5/05, 5/58, 5/13*

U.S. Cl. 260—45.75 K **8 Claims**

1. A process of preparing a linear polyester predominantly comprised of the units derived from terephthalic acid and butanediol-1,4 characterized in that the esterification of terephthalic acid with butanediol-1,4 or the transesterification of a lower dialkyl ester of terephthalic acid with butanediol-1,4 is carried out in the presence of, as catalysts, 0.001 to 0.5 percent by weight of at least one organo-tin compound and 0.001 to 0.5 percent by weight of at least one organo-titanium compound, both based on the weight of the resulting polyester, said organo-titanium compound is selected from the group consisting of (1) a compound expressed by the formula.

(1)

where R is selected from an alkyl group having 1 to 30 carbon atoms and an aryl group having 6 to 12 carbon atoms, and the same as or different from each other, (2) a product prepared by the hydrolysis of the compound (1), (3) a product prepared by the transesterification of the compound (1), and (4) a product prepared by the hydrolysis and transesterification of the compound (1), and said organo-tin compound is selected from the group consisting of compounds expressed by the formulae

(2)

and

(3)

where R is selected from an alkyl group having 1 to 30 carbon atoms and an aryl group having 6 to 12 carbon atoms; X_1, X_2, X_3 and X_4 are selected from an alkyl group having 1 to 30 carbon atoms, an aryl group having 6 to 12 carbon atoms, an acyloxy group having 1 to 10 carbon atoms, cyclohexyl group, hydroxyl group, carboxylic acid residue and halogen, and each of X_1, X_2, and X_3 is the same as or different from the others; and X_5 is either sulfur or oxygen.

3,936,422

ANTI-STATIC MODIFIED THERMOPLASTICS

Hermann O. Wirth, Bensheim-Averbach; Hans-Helmut Friedrich, Lindenfels, Odenwald, both of Germany, and Helmut Linhart, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

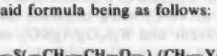
Filed Jan. 7, 1975, Ser. No. 539,139

Claims priority, application Switzerland, Jan. 10, 1974, 286/74

Int. Cl.[2] C08K *5/36*

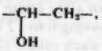
U.S. Cl. 260—45.95 N **16 Claims**

1. An antistatic mixture of a thermoplastic, comprising (a) a thermoplastic and (b) 0.01 to 5% by weight, relative to the plastic, of one of the substances of formula I or mixtures thereof, said formula being as follows:

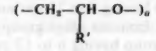
 (I)

wherein R′ denotes a hydrogen atom and/or the methyl group, Y denotes

and/or



a denotes, as an average value, a number between 1.0 and 12, n denotes, as an average value, a number from 0.5 to 8, R denotes a linear or branched alkyl radical having 8 to 24 carbon atoms, which can preferably be interrupted once by the group —O— or —S—, or denotes phenyl, phenyl substituted by linear or branched alkyl groups, or phenylalkylene having 1 to 3 carbon atoms in the alkylene chain, it being possible for the alkylene chain or the linkage thereof to the phenyl group to be interrupted by a an oxygen or sulphur atom, and for the phenyl radical thereof also to be substituted by linear or branched alkyl groups, and in all cases the whole radical contains 7 to 30 carbon atoms, it being possible, for the case where R′ is the methyl group, for R also to denote a linear or branched alkyl group having 1 to 7 carbon atoms, and in all cases of R the sum of the carbon atoms of R and of the radical



in formula I being 8 to 40.

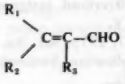
3,936,423

PROCESS FOR THE PREPARATION OF POLYALDEHYDES BY POLYMERIZATION OF BIFUNCTIONAL MONOMERS AND RELATED PRODUCTS

Giacomino Randazzo, No. 125F/, Via San Giacomo dei Capri, Naples, Italy

Filed May 3, 1974, Ser. No. 466,853
Claims priority, application Italy, May 30, 1973, 50353/73
Int. Cl.² C08F *116/34*; C02C *1/40*
U.S. Cl. 260—67 UA **8 Claims**

1. Process for the preparation of polyaldehydes by polymerization with a redox system, of bifunctional monomers having the formula:



(I)

wherein $R_1 = R_2 \neq H$ and R_3 is —H, $-CH_3$, $-C_2H_5$, $-C_3H_7$, $-C_6H_{13}$, or $-C_6H_5$ or $R_1 = R_3 = H$ and R_2 is $-CH_3$, $-C_6H_5$, or $-CH_3$ —CH=CH, comprising performing the polymerization under stirring, in absence of light and in oxygen free nitrogen atmosphere, for a period of 2-20 hours, at a temperature ranging from 0° to 40°C, using degassed and double distilled water as a solvent and $K_2S_2O_8/AgNO_3$ as a redox system, adding degassed and double distilled water to the polymerized mass, collecting the polyaldehyde by filtration and centrifugation, washing several times with water, then with 0.1 N HNO_3, again washing with water and finally with acetone and drying the product.

8. Polyaldehydes according to claim **7**, characterized by the fact that said molecular weight is 20,000 – 30,000.

3,936,424

FLAVORING AND PERFUMING INGREDIENTS

Edouard P. Demole, Coppet, Vaud, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 451,423, March 15, 1974. This application Apr. 2, 1975, Ser. No. 564,451
Claims priority, application Switzerland, Apr. 10, 1973, 5122/73; Apr. 12, 1973, 5274/73
Int. Cl.² C07C *49/17*
U.S. Cl. 260—594 **1 Claim**

1. A compound selected from the following group:
a. 8-hydroxy-5-isopropyl-non-6-en-2-one,
b. 8-hydroxy-5-isopropyl-nonan-2-one, and
c. 8-hydroxy-5-isopropyl-8-methyl-non-6-en-2-one.

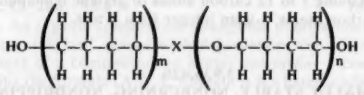
3,936,425

MODIFIED, FIRE RETARDANT POLYURETHANE

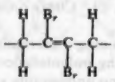
Hideo Tomomatsu, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Sept. 13, 1974, Ser. No. 505,535
Int. Cl.² C08G *18/48*
U.S. Cl. 260—77.5 AP **3 Claims**

1. A polyurethane prepared from the reaction between polyisocyanate and a high molecular weight glycol of the formula:



wherein *m* and *n* are integers including zero, and wherein both *m* and *n* are not zero at the same time, and wherein X is a structure having the formula:



wherein *m* and *n* are such that the number average molecular weight of the composition is in the range of 400–500 inclusive.

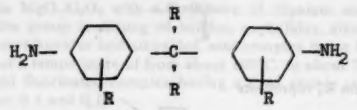
3,936,426

AMORPHOUS, OPTICALLY CLEAR POLYAMIDE FROM A BIS(4-AMINOCYCLOHEXYL)METHANE AND A PHENYLINDAN DICARBOXYLIC ACID

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

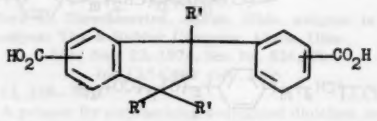
Continuation-in-part of Ser. No. 210,598, Dec. 21, 1971, Pat. No. 3,838,111. This application July 25, 1974, Ser. No. 491,834
Int. Cl.² C08G *69/26*
U.S. Cl. 260—78 R **6 Claims**

1. An amorphous, optically clear solid polyamide consisting essentially of the polymeric condensation product of
a. at least one bis(4-aminocyclohexyl)methane or a methyl derivative thereof of the formula



wherein each R is hydrogen or a methyl radical, and

b. at least one phenylindanedicarboxylic acid or an alkyl derivative thereof of the formula



wherein each R' is hydrogen or an alkyl radical having 1–3 carbon atoms.

3,936,427

MAGNESIUM SALT COPOLYMERS OF UNSATURATED DICARBOXYLIC ACID ANHYDRIDE AND UNSATURATED MONOMER HAVING A LIPOPHILE CHAIN

Andre Viout, Paris, France; David Esanu, deceased, late of Paris, France, and Lydie Esther Samama, administratrix, Paris, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

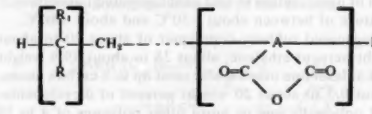
Division of Ser. No. 164,828, July 21, 1971, Pat. No. 3,860,700, which is a continuation-in-part of Ser. No. 136,238, April 21, 1971, abandoned, which is a continuation of Ser. No. 688,969, Dec. 8, 1967, abandoned. This application Mar. 25, 1974, Ser. No. 454,731

Claims priority, application Luxemburg, Dec. 8, 1966, 52541

Int. Cl.² C08F *222/02*

U.S. Cl. 260—78.5 T **3 Claims**

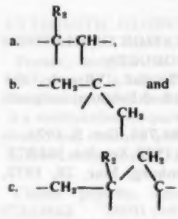
1. The magnesium salt of a copolymer having the formula



I II

wherein

A is selected from the group consisting of



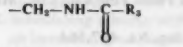
wherein

R_2 is selected from the group consisting of hydrogen and methyl, and

R is selected from the group consisting of

(d) alkyl having 8–18 carbon atoms,

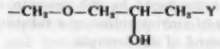
e.



wherein R_3 is alkyl having 17 carbon atoms,

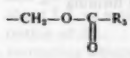
f. —O—R_4 wherein R_4 is alkyl having 16 carbon atoms,

g.



wherein Y is selected from the group consisting of —O—$C_{12}H_{25}$, —S—$C_{12}H_{25}$ and —NH—$C_{18}H_{37}$ with the proviso that when R has the values of (d) to (g), R_1 is hydrogen, and

h.



wherein R_5 is alkyl having 11–17 carbon atoms, with the proviso that when R has the value of (h), R_1 is selected from the group consisting of hydrogen and methyl, the molar ratio of monomeric units I:II is 1:1 and said copolymer has a weight average molecular weight ranging between 4,000–100,000.

3,936,428

PHOTOPOLYMERIZABLE POLYMER BASED ON AN ETHERIFIED POLYHYDROXYALKYL ACRYLATE

Hans-Jürgen Rosenkranz, Krefeld; Hans Rudolph, Krefeld-Bockum; Erich Wolff, Leichlingen, and Harald von Rintelen, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 256,161, May 23, 1972, abandoned. This application Dec. 27, 1973, Ser. No. 428,656

Claims priority, application Germany, May 25, 1971, 2125909

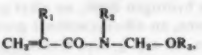
Int. Cl.² C08F *8/30, 216/06, 220/12, 222/20*

U.S. Cl. 260—78.5 T **15 Claims**

1. A photopolymerizable polymer having a backbone of from 10 to 100% by weight of a free radical polymerized monomer of the formula

CH_2=CR—CO—A—OH

and 90 to 0% by weight of at least one free radical polymerized comonomer selected from the group consisting of ethylene, propylene, butylene, butadiene, isoprene, vinyl chloride, vinylidene chloride, vinyl acetate, vinyl propionate, vinyl propyl ether, vinyl isobutyl ether, acrylic acid, methacrylic acid, esters of acrylic and methacrylic acid with alcohols having 1 to 5 carbon atoms, acrylic acid nitrile, methacrylic acid nitrile, maleic acid anhydride and styrene, said backbone having at least two hydroxyl groups which are etherified with a monomer of the formula



each of R and R_1 being separately selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, R_2 being selected from the group consisting of hydrogen and alkyl having 1 to 8 carbon atoms, R_3 being selected from the group consisting of hydrogen and alkyl having 1 to 8 carbon atoms and A being a bivalent radical selected from the group consisting of ethylene, propylene, isopropylene, butylene and $+CH_2CH_2O+_mCH_2CH_2$— wherein *m* is 1, 2 or 3.

3,936,429

REACTIVE POLYMER

Yoshio Seoka; Masato Satomura, and Akira Umehara, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

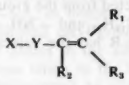
Filed Jan. 29, 1974, Ser. No. 437,564

Claims priority, application Japan, Jan. 30, 1973, 48-12298; Feb. 26, 1973, 48-23436

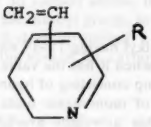
Int. Cl.[2] C08F *28/00*; C08G *75/22*; G03C *1/76*

U.S. Cl. 260—79.3 M 22 Claims

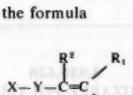
1. A reactive photosensitive composition consisting essentially of a reactive polymer produced by the reaction of a homopolymer or copolymer of vinyl pyridine or a substituted vinyl pyridine with a compound of the formula



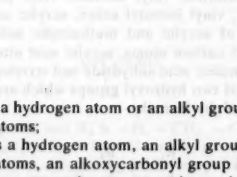
or by the reaction of a monomer of the formula



with a compound of the formula



, which reactive polymer contains repeating units of the formula:



wherein

R represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;

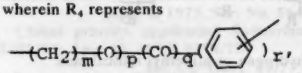
R_1 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkoxycarbonyl group having 2 to 8 carbon atoms, an aryl group, a carbamoyl group having 1 to 8 carbon atoms, a carboxy group or an acyl group having 1 to 8 carbon atoms;

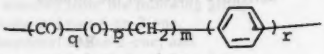
R_2 represents a hydrogen atom, a methyl group or a cyano group;

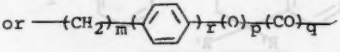
R_3 represents a hydrogen atom, a carbamoyl group having 1 to 8 carbon atoms, a nitro group, a cyano group, an alkoxy group having 1 to 3 carbon atoms or an alkoxycarbonyl group having 2 to 8 carbon atoms;

Y represents a divalent radical wherein -Y- is

wherein R_4 represents





or 

wherein *m* is 0, 1, 2 or 3; *p*, *q* and *r* is 0 or 1;

R_5 represents a hydrogen atom or a methyl group

X represents a halogen atom, an alkylsulfonyloxy group having 1 to 4 carbon atoms, a styrenesulfonyloxy group or an arylsulfonyloxy group having 6 to 10 carbon atoms.

3,936,430

PROCESS FOR THE PREPARATION OF HALOGEN-CARRYING RUBBERLIKE COPOLYMERS

Löwhardt A. A. Schoen; Marinus J. R. Visseren, both of Geleen, and Jean G. van der Sangen, Spaubeek, all of Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Filed Dec. 22, 1972, Ser. No. 317,786

Claims priority, application Netherlands, Dec. 23, 1971, 7117709

Int. Cl.[2] C08F *210/00*, *110/02*, *212/00*

U.S. Cl. 260—80.78 14 Claims

1. A process for preparing halogenated rubbery copolymers of about 20 to about 74.7 weight percent ethylene, about 25 to about 79.9 weight percent of at least one other α-alkene of up to 8 carbon atoms, from about 0.3 to about 20 weight percent of dicyclopentadiene, alone or with one or more other polyenes of 4 to 12 carbon atoms, said process comprising halogenating the unhalogenated copolymer in the solid state with up to about 20 moles of molecular halogen per gram equivalent of unsaturation in said unhalogenated copolymer at a temperature of between about −30°C and about +80°C.

14. Halogenated rubbery copolymer of about 20 to about 74.7 weight percent ethylene, about 25 to about 79.9 weight percent of at least one other α-alkene of up to 8 carbon atoms. From about 0.3 to about 20 weight percent of dicyclopentadiene and optionally one or more other polyenes of 4 to 10 carbon atoms, containing from about 0.5 to about 5 percent by weight of chlorine, of which at least about 0.35 percent by weight is allylic, taken up in the dicyclopentadiene units of the copolymer.

3,936,431

PROCESS FOR THE POLYMERIZATION OF OLEFINS AND CATALYTIC PRODUCTS

Luigi Reginato, Brussels; Charles Bienfait, Vilvorde, and Jacques Stevens, Braine-L'Alleud, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Continuation-in-part of Ser. No. 186,764, Oct. 5, 1971, abandoned. This application Mar. 26, 1973, Ser. No. 344,873

Claims priority, application Luxemburg, Mar. 28, 1972, 65059

Int. Cl.[2] C08F *4/02*, *4/66*, *10/02*

U.S. Cl. 260—88.2 R 8 Claims

1. A cocatalyst for use with an organometallic compound of a metal selected from the Groups Ia, IIa, IIb, IIIa and IVa of the Periodic Table to catalyze the polymerization and copolymerization of α-olefins consisting essentially of the reaction product of a fluorinated complex oxide having the general

formula $MgO.Al_2O_3$ with a derivative of titanium selected from the group consisting of halides, oxyhalides, alkoxyhalides, oxyalkoxides and alkoxides, said complex being fluorinated at a temperature of from about 100°C. to about 700°C. and said fluorinated complex having a F/Al atomic ratio of between 0.1 and 0.15.

3,936,432

PROCESS OF POLYMERIZATION OF CONJUGATED DIOLEFINS USING IRON CATALYSTS AND SULFUR LIGANDS

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 22, 1974, Ser. No. 526,356
Int. Cl.² C08F 4/40, 2/06
U.S. Cl. 260—94.3 **13 Claims**

1. A process for polymerizing conjugated diolefinic monomers containing from 4 to about 12 carbon atoms by bringing said monomers into contact with a catalytically effective amount of a catalyst consisting essentially of (1) an iron containing compound, (2) an organometallic reducing agent from Groups I and III of the Periodic Table, and (3) a sulfur-containing ligand characterized in that said ligand contains at least two functional groups wherein said functional groups are a combination of (a) two thio groups which are attached to different carbon atoms, (b) a mercapto and an imino, imine or imidazole group, (c) an hydroxyl and an imino, imine or imidazole group, or (d) a thio and an amine or imino group.

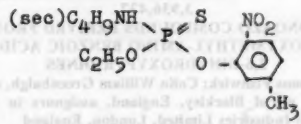
3,936,433

O-ETHYL-O-(3-METHYL-6-NITROPHENYL)-N-SECONDARY BUTYL-PHOSPHOROTHIONOAMIDATE

Takeo Satomi, Takarazuka; Kunio Mukai, Nishinomiya; Akihiko Mine; Naganori Hino, both of Toyonaka; Kohshi Tateishi, and Masachika Hirano, both of Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 182,523, Sept. 21, 1971, abandoned. This application May 29, 1974, Ser. No. 474,444
Claims priority, application Japan, Sept. 25, 1970, 45-84432; United Kingdom, June 1, 1973, 26377/73
Int. Cl.² C07F 9/24; A01N 9/36
U.S. Cl. 260—954 **1 Claim**

1. A phosphorothionoamidate of the formula:



3,936,434

CYTOBIOTIC GLOBULINS FOR KIDNEY TREATMENT

Robert Ardry, Clamart, and Michel Robilliart, Paris, both of France, assignors to Omnium Financier Aquitaine pour l'Hygiene et la Sante (Sanofi), Courbevoie, France

Continuation-in-part of Ser. No. 312,021, Dec. 4, 1972, which is a continuation-in-part of Ser. No. 111,760, Feb. 1, 1971, abandoned, which is a continuation of Ser. No. 766,313, Oct. 9, 1968, abandoned. This application Apr. 23, 1973, Ser. No. 353,890
Claims priority, application France, Oct. 10, 1967, 67.123862
Int. Cl.² A61K 37/06; C07G 7/00
U.S. Cl. 260—112 B **2 Claims**

1. A method of producing cytobiotic globulins comprising the steps of:
   1. macerating a ground-kidney organ of a healthy slaughterhouse animal or preferably of an embryo in an aqueous solution containing about 0.9% by weight sodium chloride, and thereafter centrifugating the suspension to obtain a soluble antigenic extract and an insoluble tissue homogenate;
   2. inoculating a horse with said antigenic extract to induce an immunological response in the blood of the inoculated horse;
   3. withdrawing blood from said inoculated horse and separating plasama therefrom;
   4. extracting a globulin-containing liquid from said plasma by combining said plasma with an aqueous saturated solution of ammonium sulfate to produce a precipitate; separating a solution from the last-mentioned precipitate and treating it with a further quantity of ammonium sulphate to form a further precipitate; forming a paste of said further precipitate in distilled water and dialyzing said paste to complete disappearance of ammonium salts; and recovering a further dialysate constituting said globulin-containing liquid extract;
   5. adding water, sodium chloride and sodium hydroxide to said globulin-containing liquid to adjust it to a pH of about 7.3, an ionic strength of 0.16 and a protein concentration of 5%;
   6. contacting adjusted globulin-containing liquid with tissue homogenate which has been previously treated with a sodium citrate solution 0.15 M having a ph of about 3.1 and washed with a sodium chloride solution 0.15 M having a pH of about 7.5;
   7. decanting the liquid and eluting globulins adsorbed onto tissue homogenate with a sodium citrate solution 0.15 M having a pH of 3.1;
   8. adjusting the elution solution to a pH of 7.5, separating the precipitate and dialyzing the elution solution against a sodium chloride solution 0.15 M;
   9. lyophilizing the dialyzed solution to obtain cytobiotic globulins.

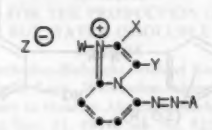
3,936,435

CATIONIC HETEROCYCLIC-AZO-HETEROCYCLIC COMPOUNDS FROM 5-AMINOIMIDAZO-(1,2-A)PYRIDINES

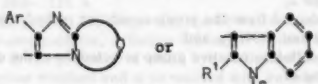
Gary T. Clark, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,619
Int. Cl.² C09B 43/00, 29/36
U.S. Cl. 260—146 R **11 Claims**

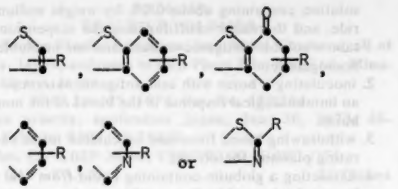
1. Dyestuff having the general formula



wherein A represents



wherein Q is



Ar is phenyl or phenyl substituted with chlorine, bromine, lower alkyl or lower alkoxy;
R is hydrogen, lower alkyl, phenyl or phenyl substituted with lower alkyl, lower alkoxy, chloro or bromo;
R^1 and R^2 are the same or different and each is hydrogen, lower alkyl, benzyl or phenyl;
W is lower alkyl or benzyl;
X is hydrogen or lower alkyl;
Y is hydrogen, lower alkoxycarbonyl, lower alkyl or formyl; and
Z is a basic dye anion.

3,936,436

WATER-SOLUBLE AZO DYESTUFFS CONTAINING TRIAZINE AND 3-AZO-2,6-DIHYDROXYPYRID-6-ONE RADICALS

Alistair Howard Berrie, and Richard Budziarek, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

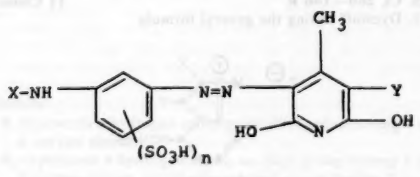
Continuation of Ser. No. 100,449, Dec. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 860,033, Sept. 22, 1969, abandoned. This application May 2, 1973, Ser. No. 356,421

Claims priority, application United Kingdom, Dec. 22, 1969, 60322/69; July 27, 1970, 36199/70

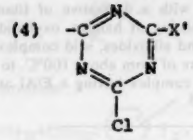
Int. Cl.² C09B *62/08, 62/24, 62/40, 62/50*

U.S. Cl. 260—153 **4 Claims**

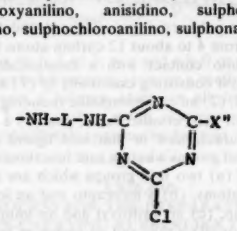
1. A monoazo dyestuff of the formula



wherein
n is 1 or 2;
Y is selected from the group consisting of hydrogen, lower alkyl and $CONH_2$; and
X is a cellulose reactive group selected from the class consisting of
1. 5-cyano-2,4-dichloropyrimidyl,
2. 5-cyano-2,6-dichloropyrimidyl,
3. 5-chloro-6-methyl-2-methylsulphonylpyrimidyl, and



wherein X′ is selected from the group consisting of Cl, NH_2, lower alkoxy, lower alkylamino, di-(lower alkyl) amino, di-(hydroxy-lower alkyl) amino, morpholino, cyclohexylamino, benzylamino, sulphoanilino, disulphanilino, carboxyanilino, sulphocarboxyanilino, anisidino, sulphoanisidino, sulphotoluidino, sulphochloroanilino, sulphonaphthylamino and



wherein L is mono- or di-sulphonated phenylene and X″ is selected from the group consisting of Cl, NH_2, lower alkoxy lower alkylamino, hydroxy-lower alkylamino, anilino, sulphoanilino, disulphoanilino, sulphotoluidino, sulphocarboxyanilino, sulphonaphthylamino, disulphonaphthylamino and trisulphonaphthylamino.

3,936,437

MONOAZO COMPOUNDS DERIVED FROM 2-HYDROXYMETHYL-AMINO BENZOIC ACIDS AND 2,6-DIHYDROXYPYRIDINES

Brian Ribbons Fishwick; Colin William Greenhalgh, and Nigel Hughes, all of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

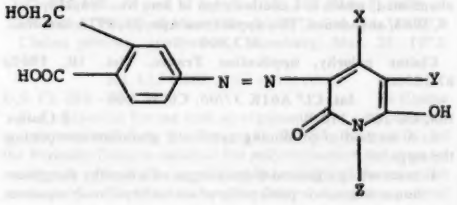
Filed Dec. 17, 1973, Ser. No. 425,278

Claims priority, application United Kingdom, Dec. 22, 1972, 59315/72

Int. Cl.² C09B *29/36*

U.S. Cl. 260—156 **2 Claims**

1. A disperse monoazo dyestuff free from sulphonic acid groups having the formula



wherein X is selected from the group consisting of lower alkyl, phenyl, phenyl lower alkyl linked to the pyridone ring through said lower alkyl, lower alkoxy lower alkyl, cyano lower alkyl, phenoxy lower alkyl, lower alkoxy carbonyl lower alkyl and N:N-di(lower alkyl) carbamoyl; Y is selected from the group consisting of cyano, hydrogen, lower alkyl, carbamoyl, N-lower alkyl carbamoyl, N:N-di(lower alkyl) carbamoyl, lower alkyl sulphonyl, phenylsulphonyl, sulphamoyl, N-lower alkyl sulphamoyl, N:N-di(lower alkyl) sulphamoyl, lower alkoxycarbonyl, lower alkylcarbonyl, benzoyl, bromine, chlorine and lower alkylamino lower alkyl; and Z is selected from the group consisting of hydrogen, alkyl having from 1 to 12 carbon atoms, lower alkoxy lower alkyl, hydroxy lower alkyl, lower alkylcarbonyloxy lower alkyl, lower alkoxycarbonyl lower alkyl, cyclohexyl, phenyl lower alkyl linked to the pyridone ring through said lower alkyl, chloro lower alkyl, phenoxy lower alkyl, phenylthio lower alkyl, cyano lower alkyl, cyano lower alkoxy lower alkyl, benzyl carbonyloxy lower alkyl, phenoxy carbonyloxy lower alkyl, lower alkylcarbonyl lower alkyl, benzoyl lower alkyl, phenylsulphonyl lower alkyl, benzoylamino lower alkyl, phenyl, tolyl, anisyl, chlorophenyl, amino, N-lower alkylamino, N:N-di(lower alkyl) amino, anilino, toluidino, benzylamino and cyclohexylamino.

3,936,438

AROMATIC CARDENOLIDE ACETALS

Hartenstein, Wittental; Gerhard Satzinger, Denzlingen, and Manfred Herrmann, Saint Peter, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

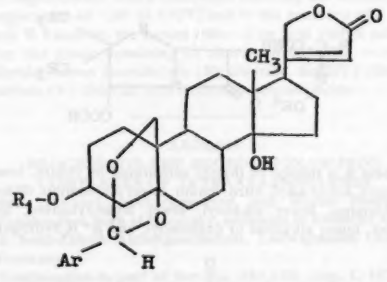
Filed Sept. 27, 1974, Ser. No. 509,752

Claims priority, application Germany, Oct. 8, 1973, 2350392

Int. Cl.² C07J *173/00*

U.S. Cl. 260—210.5 **34 Claims**

1. Cardenolide acetals of the formula:



wherein R_1 is a glycosyl radical and Ar is a phenyl, furyl, thienyl or pyridyl radical which can be substituted by halogen atoms, alkyl or alkoxy radicals containing up to 3 carbon atoms or by trifluoromethyl, methylenedioxy or ethylenedioxy radicals.

3,936,439

2,6-DIAMINONEBULARINE DERIVATIVES

Ryuji Marumoto; Yoshio Yoshioka; Mikio Honjo, and Katsuyoshi Kawazoe, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

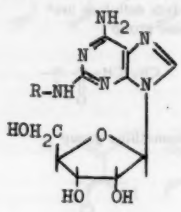
Filed Nov. 30, 1973, Ser. No. 420,380

Claims priority, application Japan, Dec. 8, 1972, 47-123602; Oct. 11, 1973, 48-114542

Int. Cl.² C07H *19/16*

U.S. Cl. 260—211.5 R **15 Claims**

1. A 2,6-diaminonebularine derivative of the formula



wherein R is a phenyl or cyclohexyl group which may be substituted with lower alkyl, lower alkoxy or halogen, or pharmaceutically acceptable mineral acid salts thereof.

3,936,440

METHOD OF LABELING COMPLEX METAL CHELATES WITH RADIOACTIVE METAL ISOTOPES

Amar Nath, Bala Cynwyd, Pa., assignor to Drexel University, Philadelphia, Pa.

Filed May 22, 1974, Ser. No. 472,305

Int. Cl.² C07H *23/00*

U.S. Cl. 260—211.7 **23 Claims**

1. A method of labeling a complex metal chelate compound with a radioactive metal isotope, comprising the steps of;

a. providing a radioactive metal isotope dopant and a complex metal chelate compound in solution; then

b. removing solvent from said solution of radioactive metal dopant and complex metal chelate compound, whereby a solid mixture of said radioactive metal isotope dopant and complex metal chelate compound is formed; then

c. exposing said mixture to an electron-accepting gas; and then

d. subjecting said mixture in the presence of said electron-accepting gas to thermal treatment, whereby isotopic exchange between said radioactive metal isotope dopant and said complex metal chelate compound occurs and said complex metal chelate compound labeled with said radioactive metal isotope is produced.

3,936,441

PROCESS FOR THE PRODUCTION OF WATER ADSORBING BUT WATER-INSOLUBLE CELLULOSE ETHERS

Arno Holst, Wiesbaden-Biebrich; Michael Kostrzewa, Wiesbaden, and Helmut Lask, Wiesbaden-Schierstein, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Nov. 11, 1974, Ser. No. 522,741

Claims priority, application Germany, Nov. 15, 1973, 2357079

Int. Cl.² C08B *11/00, 11/20, 11/193, 15/10*

U.S. Cl. 260—231 A **11 Claims**

1. In the process for the production of water-adsorbing, but largely waterinsoluble, cellulose ethers, in which cellulose is alkalized in the presence of alkali hydroxide and isopropanol as a reaction medium and is so reacted with an etherification agent that by etherification only a water-soluble cellulose ether is produced, and in which process the cellulose is reacted with a cross-linking agent which is polyfunctional

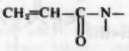
towards cellulose in an alkaline reaction medium before, during, or after the etherification of the cellulose,

the improvement which comprises effecting the etherification of cellulose to carboxymethyl cellulose, carboxymethyl hydroxyethyl cellulose, hydroxyethyl cellulose, or methylhydroxyethyl cellulose,

reacting the cellulose with the polyfunctional cross-linking agent in the presence of 0.8 to 7.5 parts by weight of isopropanol, based upon the cellulose weight,

and employing as the cross-linking agent acrylamido methylene chloroacetamide, dichloroacetic acid or phosphorus oxychloride or a compound in which at least two groups functional towards cellulose are

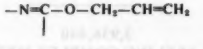
the acrylic amino group



the chlorine azomethine group

or

the allyloxy azomethine group



3,936,442

UNREIDOACETAMIDO-PENICILINS

Hans-Bodo Konig; Wilfried Schrock, both of Wuppertal-Elberfeld; Hans Disselnkotter, Cologne, and Karl Georg Metzer, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

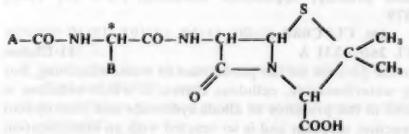
Division of Ser. Nos. 145,809, May 21, 1971, abandoned, and Ser. No. 145,877, May 21, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 426,308

Claims priority, application Germany, May 25, 1970, 2025414; May 25, 1970, 2025415

Int. Cl.[2] C07D *499/58*

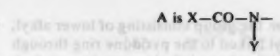
U.S. Cl. 260—239.1 49 Claims

1. A penicillin of the formula:



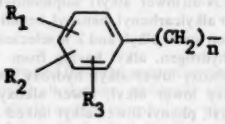
or a pharmaceutically acceptable non-toxic salt thereof wherein

A is



wherein

X is lower alkyl, phenylvinyl, nitro-phenylvinyl, or a group of the formula:



wherein

n is 0 or 1; and

R_1, R_2 and R_3 are the same or different and each is hydrogen, chlorine, bromine, fluorine, nitro, lower alkyl or lower alkoxy, or

one is methoxycarbonylamino and the other two are each hydrogen;

Y is lower alkyl, allyl, phenyl or benzyl;

B is thienyl, phenyl or phenyl substituted by lower alkyl, lower alkoxy, mono-, or di-halogen or lower alkylthio; and

C can have either of the two possible R- and W- stereoisomeric configurations or it can be a mixture of such diastereomers.

3,936,443

PENICILLIN ANTIBIOTICS

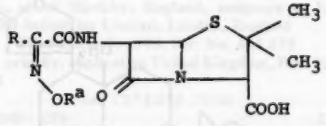
Michael Gregson, London; Martin Christopher Cook, and Gordon Ian Gregory, both of Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Division of Ser. No. 466,780, May 3, 1974, which is a division of Ser. No. 274,602, July 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 221,057, Jan. 26, 1972, abandoned. This application July 11, 1975, Ser. No. 595,105

Int. Cl.[2] C07D *499/70*

U.S. Cl. 260—239.1 3 Claims

1. A compound selected from the group consisting of a penicillin antibiotic of the formula



wherein R is thienyl or thienyl substituted by chloro, bromo, hydroxy, lower alkyl, nitro, amino, lower alkylamino, di(lower alkyl)amino, lower alkanoyl, lower alkanoylamido, lower alkoxy, lower alkylthio or carbamoyl; and R^a is hydrogen or

wherein R^c is C_1–C_4 alkyl, C_1–C_4 chloroalkyl, C_1–C_4 alkoxy, phenyl, nitrophenyl, C_1–C_4 alkylamino or C_1–C_4 chloroalkylamino; and a physiologically acceptable salt thereof, said penicillin antibiotic being in the form of the syn isomer free of the corresponding anti isomer to the extent of at least 75%.

3,936,444

PRODUCTION OF ARYL LACTAM-HYDRAZONES

Arthur Botta, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

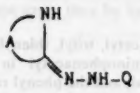
Filed July 9, 1973, Ser. No. 377,862

Claims priority, application Germany, July 18, 1972, 2235177

Int. Cl.[2] C07D *223/12, 213/77, 207/14, 211/56*

U.S. Cl. 260—239 B 3 Claims

1. In the production of an aryl lactamhydrazone of the formula



(I)

in which

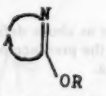
A represents polymethylene of 3 to 11 carbon atoms, and

Q represents phenyl; phenyl carrying at least one substituent selected from the group consisting of C_{1-6} alkyl, fluorine, chlorine, bromine, nitro and methoxy;

or

substituted by at least one C_1-C_6 alkyl, fluorine, chlorine, bromine, methoxy or nitro group,

in which a lactim-ether of the formula



(II)

in which

R is phenyl or alkyl or 1 to 6 carbon atoms,

is reacted with an arylhydrazine or heteroarylhydrazine of the formula

$H_2N-NH-Q$ (III)

the improvement which comprises effecting the reaction at a temperature of −20° to 150°C and in the presence of 1 to 10 mole % based on the lactim-ether of an acid catlyst selected from the group consisting of aluminum chloride, iron (III) chloride, boron fluoride, tin (II) chloride, tin (IV) chloride, titanium (V) chloride and antimony pentachloride.

3,936,445

PROCESS FOR THE PRODUCTION OF IRON COMPLEXES OF TETRAAZAANNULENES

Helmut Pfitzner, Neckargemuend, and Walter Dammert, Frankenthal, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

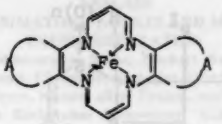
Continuation-in-part of Ser. No. 384,628, Aug. 1, 1973, abandoned. This application Mar. 14, 1974, Ser. No. 451,034

Claims priority, application Germany, July 4, 1973, 2333925

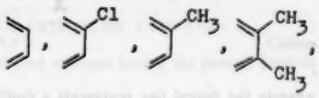
Int. Cl.[2] C07D *257/00, 259/00*

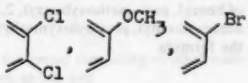
U.S. Cl. 260—239 DD 3 Claims

1. Process for the production of an iron complex of a tetraazaannulene of the formula



where A is



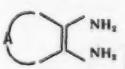


or

, said process

comprising the step of reacting one mole of isoxazole of the formula

with one mole of a diamine of the formula



where A has the meaning given above, and with about ½ mole of an iron compound selected from the group consisting of.

iron salts of organic mono- or dicarboxylic acids selected from the group consisting of formic, acetic, propionic, glyoxylic, lactic, malic, gluconic, oxalic, malonic, succinic, maleic, fumaric, tartaric and citric acid;

iron acetyl acetonate;

iron carbonate; and

iron hydroxides.

3,936,446

ISOCYANOCEPHALOSPORANATES

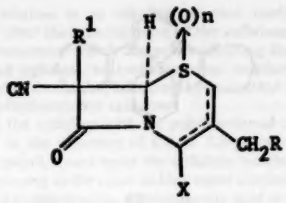
Peter Hubert Bentley, Rudgwick, and John Peter Clayton, Horsham, both of England, assignors to Beecham Group Limited, Germany

Filed Feb. 19, 1974, Ser. No. 443,724

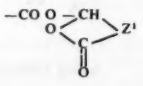
Int. Cl.[2] C07D *279/08*

U.S. Cl. 260—243 R 8 Claims

1. A compound of formula:



wherein the dotted line represents a double bond at either position 2- or 3-, *n* is zero of 1, X is a carboxylic acid group, a non-toxic salt thereof, or an esterified carboxylic acid group wherein the ester portion is selected from the group consisting of benzyl, para-methoxybenzyl, 2,2,2-trichloroethyl, tertbutyl, acetoxymethyl, pivaloyloxymethyl, phthalidyl and a lactone of the formula



wherein Z^1 is 1,2-phenylene or 4,5-dimethoxyphenyl-1,2-ene, R is hydrogen, an acetoxy group, a pyridinium group or a group of the formula $-SR^2$, wherein R^2 represents a 5- or 6-membered heterocyclic ring containing one to four nitrogen heteroatoms, one oxygen heteroatom and one to three nitrogen heteroatoms or one sulphur heteroatom and one to three nitrogen heteroatoms, unsubstituted or substituted with one or two groups selected from alkyl, cycloalkyl, or alkenyl, each having up to four carbon atoms, alkoxy or alkoxyalkyl, each alkyl or alkoxy having one to four carbon atoms, CF_3, NHR^3, NR_2^3, SCH_2, halogen, amino, phenyl and benzyl wherein R^3 is alkyl of 1 to 4 carbon atoms; or X and R taken together represent the divalent radical

and R^1 is hydroxyloweralkyl, lowerakloxycarbonylloweralkyl, benzyloxycarbonylloweralkyl, benzyl or loweralkylthio.

3,936,447

7-ACYLAMINO-DESACETOXY-CEPHALOSPORANIC ACID ESTERS AND THEIR PRODUCTION

Uwe Petersen, Cologne; Hans-Joachim Kabbe, and Siegfried Petersen, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

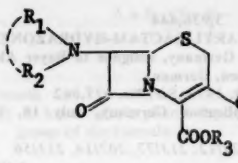
Filed Mar. 26, 1974, Ser. No. 454,921

Claims priority, application Germany, Apr. 19, 1973, 2320040

Int. Cl.[2] C07D *501/18, 501/10*

U.S. Cl. 260—243 C **28 Claims**

1. A process for the production of a 7-acylamino-desacetoxy-cephalosporanic acid ester of the formula:



I

wherein

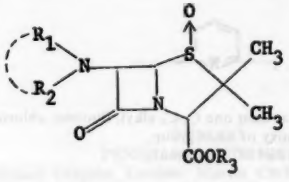
R_1 is hydrogen, and

R_2 is phenacetyl, phenoxyacetyl, trityl, thienylacetyl, tert.-butoxycarbonyl or α-aminophenacetyl in which the amino moiety is protected, and the phenyl ring is unsubstituted or substituted by hydroxyl, lower alkoxy, lower alkylmercapto or halogen; or

R_1 and R_2 together with the nitrogen atom to which they are attached are phthalimido or succinimido; and

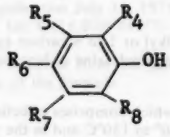
R_3 is benzyl, methoxybenzyl, nitrobenzyl, diphenylmethyl, trityl, β,β,β-trichloroethyl, cyanomethyl, 9-fluorenyl, tert.-butyl, phenacyl, chlorophenacyl, bromophenacyl, nitrophenacyl, phenylphenacyl, alkoxyphenacyl or trimethylsilyl,

which comprises the steps of heating a 6-aminopenicillanic acid-sulfoxide-ester of the formula:



II

wherein R_1, R_2 and R_3 are as above defined, at temperatures of from 60°C to 150°C in the presence of from 5 to 80 mol % of a phenol of the formula:



wherein R_4, R_5, R_6, R_7 and R_8 are the same or different and each is selected from the group consisting of hydrogen, nitro, cyano, halogen, perhaloalkyl of 1 to 4 carbon atoms, carbalkoxy of 2 to 5 carbon atoms, or phenylsulphonyl, only one of R_4, R_5, R_6, R_7 and R_8 being halogen and not more than two of R_4, R_5, R_6, R_7 and R_8 being hydrogen, and recovering the compound produced.

3,936,448

α-AMINO-β-SULFOSUCCINATES

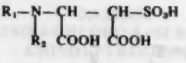
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 394,613, Sept. 5, 1973, which is a division of Ser. No. 156,933, June 25, 1971, abandoned. This application July 1, 1974, Ser. No. 484,916

Int. Cl.[2] C07C *143/15*

U.S. Cl. 260—247.1 E **1 Claim**

1. An α-substituted-β-sulfosuccinic acid having the formula



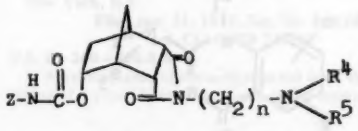
or the alkali metal, ammonium, monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methylmonoethanolammonium and N-ethylmonoethanolammonium salts thereof; wherein the groups R_1 and R_2 may be the same or different and are selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_1 to C_4 hydroxyalkyl, carboxymethyl, carboxyethyl, sulfomethyl, sulfoethyl; with the proviso that both R_1 and R_2 may not at the same time be hydrogen.

3,936,449
ANTI-ARRHYTHMIC AGENTS

Ichiro Matuo, Machida, and Sadao Ohki, Tokyo, both of Japan, assignors to Sadao Ohki, Tokyo, Japan

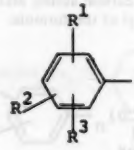
Filed Apr. 11, 1974, Ser. No. 459,971
Int. Cl.² C07D *295/02, 295/00*
U.S. Cl. 260—247.2 A **16 Claims**

1. A compound having the formula

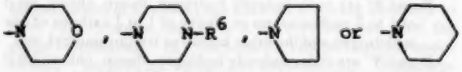


I

in which Z is a radical of the formula



wherein R^1, R^2 or R^3 is H, Cl, Br, F, (lower)alkyl, nitro, OH or (lower)alkoxy, *n* is an integer of 2 to 4 inclusive and R^4 or R^5 is H, (lower)alkyl or when taken together with the nitrogen a radical of the formula



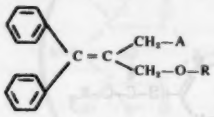
in which R^6 is (lower)alkyl; or a pharmaceutically acceptable acid addition salt thereof.

3,936,450
ANTI-INFLAMMATORY AGENTS AND METHOD FOR THEIR PREPARATION

Roland Yves Mauvernay, Riom; Norbert Bush, Loubeyrat; Jacques Simond, Chamalieres; Andre Monteil, Gerzat, and Jacques Moleyre, Mozac, all of France, assignors to Centre Europeen de Recherches Mauvernay "C.E.R.M.", Riom, France

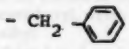
Filed Feb. 7, 1973, Ser. No. 330,455
Claims priority, application United Kingdom, Feb. 8, 1972, 5827/72
Int. Cl.² C07D *295/00*; C07C *87/29*
U.S. Cl. 260—247.7 Z **7 Claims**

1. A tetra-substituted ethylene having the general formula

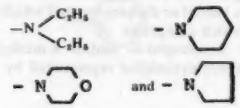


(I)

in which R is selected from the group consisting of alkyl radicals containing 1 to 4 carbon atoms and



and A is selected from the group consisting of



and salts thereof with pharmacologically acceptable acids.

3,936,451
PROCESS FOR PRODUCING SALTS OF HEXAMETHYLENETETRAMINE

Henry Philip Orem; David R. Hart, both of Birmingham, and Jerry E. Hill, Springville, all of Ala., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Aug. 27, 1974, Ser. No. 500,845
Int. Cl.² C07D *251/04*
U.S. Cl. 260—248.5 **4 Claims**

1. A method of preparing a salt of hexamethylenetetramine comprising:

thoroughly mixing hexamethylenetetramine, water, and an acid wherein the acid is selected from the group consisting of p-Toluenesulfonic Acid, Methanesulfonic Acid, Phenolsulfonic Acid, Benzenesulfonic Acid, m-Xylenesulfonic Acid, m-Benzenedisulfonic Acid, Oxalic Acid, Malic Acid, Sulfuric Acid, Hydrochloric Acid, beta-Resorcylic Acid, Benzoic Acid, Maleic Acid, and Formic Acid, in which mixture the amount of water is less than 26 percent by weight,

controlling the temperature of the mixture during the mixing stage below that which would cause decomposition; and

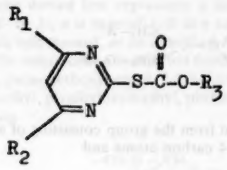
drying the mixture at a temperature less than that which would cause decomposition.

3,936,452
PROCESS OF PRODUCING PYRIMIDYL THIOCARBONATES

Takeshi Nagasawa; Katumasa Kuroiwa, and Kouichi Narita, all of Koriyama, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Division of Ser. No. 287,410, Sept. 8, 1972, Pat. No. 3,852,290. This application June 13, 1974, Ser. No. 479,189
Int. Cl.² C07D *239/10*
U.S. Cl. 260—251 R 9 Claims

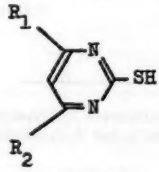
1. A process for producing a thiolcarbonate represented by the formula,



(I)

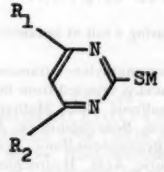
wherein R_1 and R_2 are individually hydrogen or methyl, and R_3 is a straight chain or branched chain alkyl having 1 to 5 carbons, a straight chain or branched chain alkenyl having 2 to 5 carbon, or a benzyl or diphenylmethyl which may be nuclear substituted, which comprises

reacting a 2-mercapto-4- and/or 6-methyl-substituted or unsubstituted pyrimidine represented by the formula,



(V)

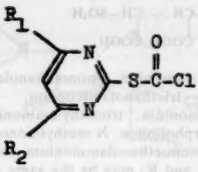
wherein R_1 and R_2 are as defined above, with an alkali metal hydroxide in an aqueous solution to form an alkali metal salt of the formula,



(II)

wherein R_1 and R_2 are as defined above, and M is an alkali metal,

reacting the thus formed alkali metal salt (II) with phosgene in an inert solvent in the absence of water at a temperature below the reflux temperature of said solvent to prepare a pyrimidyl-2-thiolchloroformate of the formula,



(III)

wherein R_1 and R_2 are as defined above, and

then reacting the compound of the formula (III) with an alcohol represented by the formula,

$R_3 - OH$ (IV)

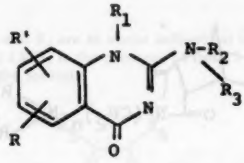
wherein R_3 is as defined above, in an inert solvent in the presence of a base and in the absence of water at a temperature below the reflux temperature of the solvent used.

3,936,453
1-SUBSTITUTED-2-DISUBSTITUTED AMINOQUIN AZOLIN-4(1H)-ONES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

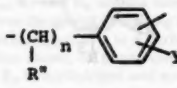
Continuation-in-part of Ser. No. 437,472, Jan. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 373,101, June 25, 1973, abandoned. This application July 24, 1974, Ser. No. 491,309
Int. Cl.² C07D *239/84*
U.S. Cl. 260—256.4 Q 10 Claims

1. A compound of the formula



wherein

R_1 is alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 8 carbon atoms or phenalkyl of the formula:



n is 1 or 2

R'' is hydrogen or methyl provided that R'' is hydrogen when *n* is 2,

R_2 and R_3 are independently alkyl of 1 to 4 carbon atoms or alkenyl of 3 to 6 carbon atoms,

R and R' are independently hydrogen, fluoro, chloro, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbons or one is hydrogen and the other bromo or trifluoromethyl, and

Y and Y' are independently hydrogen, fluoro, chloro, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms or one is hydrogen and the other bromo or trifluoromethyl.

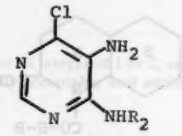
3,936,454

5-AMINO-4-CHLORO-6-(SUBSTITUTED AMINO)-PYRIMIDINES

Charles F. Schwender, Lebanon, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 388,290, Aug. 14, 1973, Pat. No. 3,862,189. This application Aug. 5, 1974, Ser. No. 494,661
Int. Cl.² C07D *239/26*
U.S. Cl. 260—256.4 N 5 Claims

1. A compound of the formula II:



wherein R_2 is naphthyl alkyl of 1 to 3 carbons or phenyl alkyl of 1 to 3 carbons substituted in the aryl moiety by one or two alkoxy of 1 to 6 carbons or one or two chloro.

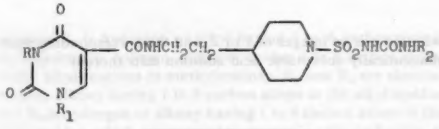
3,936,455

PIPERIDINESULFONYLUREA DERIVATIVES

Hans E. Wiedermann, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 546,003
Int. Cl.² C07D *239/00*
U.S. Cl. 260—256.5 R 11 Claims

1. A sulfamylurea compound selected from the group consisting of 1-piperidinesulfonylureas of the formula:



and the base salts thereof with pharmacologically acceptable cations, wherein R and R_1 are each alkyl having from one to three carbon atoms, and R_2 is a member selected from the group consisting of bicyclo[2.2.1]hept-5-en-2-yl-endo-methyl, bicyclo[2.2.1]hept-2-yl-endo-methyl, 7-oxabicyclo[2.2.1]hept-2-yl-endo-methyl,

1-adamantyl and cycloalkyl having from five to eight carbon atoms.

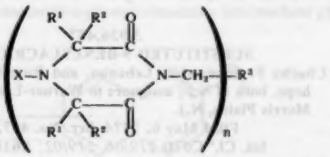
3,936,456

SUBSTITUTED PIPERAZINE DIONE OXYLS AND HYDROXIDES AND POLYMER COMPOSITIONS STABILIZED THEREBY

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciby-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 237,956, March 24, 1972, abandoned. This application July 16, 1973, Ser. No. 379,901
Int. Cl.² C07D *241/02*
U.S. Cl. 260—268 DK 20 Claims

1. A compound of the formula



wherein

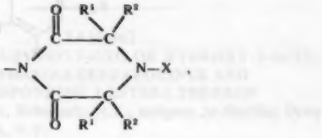
X is O or OH;

R^1 and R^2 are independently of each other methyl or ethyl or together with the carbon to which they are bound are cyclopentyl or cyclohexyl, which is unsubstituted or substituted with methyl;

n is an integer of from 1 to 3;

when *n* is 1, R^3 is hydrogen, alkyl of from 1 to 19 carbon atoms,

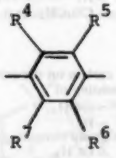
or



wherein

R^1, R^2 and X are as defined above;

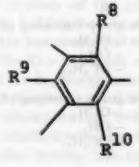
when *n* is 2, R^3 is the direct bond, alkylene of from 1 to 18 carbon atoms, or



wherein

R^4, R^5, R^6, and R^7 are hydrogen or methyl;

when *n* is 3, R^3 is



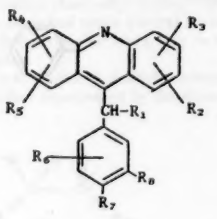
wherein
R^8, R^9, and R^{10} are hydrogen or methyl.

3,936,457
SUBSTITUTED 9-BENZYLACRIDINES

Charles F. Schwender, Lebanon, and Russell E. Pike, Stanhope, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 6, 1974, Ser. No. 467,242
Int. Cl.[2] C07D *219/06, 219/02;* A61K *31/47*
U.S. Cl. 260—279 R 9 Claims

1. A substituted 9-benzylacridine of the general formula:



I

R_1 is selected from the group consisting of
—H,
—CO_2CH_3;

R_2 is at the number 2 carbon on the acridine ring and is selected from the group consisting of
—OCH_3,
—H;

R_3 is selected from the group consisting of
—OCH_3,
—H;

R_4 is
—H;

R_5 is
—H;

R_6 is
—H;

R_7 is selected from the group consisting of
—OCH_3,
—OH,
—OC_2H_5,
—Cl;

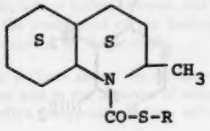
R_8 is selected from the group consisting of
—OCH_3,
—OH,
—OC_2H_5,
—H.

3,936,458
SUBSTITUTED 2-AZABICYCLOALKANES AS SELECTIVE HERBICIDES

Elmar Sturm, Aesch, Basel, and Christian Vogel, Binningen, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 52,986, July 7, 1970, abandoned. This application Nov. 19, 1973, Ser. No. 417,303
Int. Cl.[2] C07D *215/08*
U.S. Cl. 260—283 S 4 Claims

1. A compound of the formula



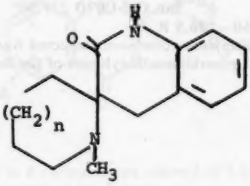
wherein R is ethyl, n-propyl or isopropyl.

3,936,459
1′,4′-DIHYDRO-1-METHYL-SPIRO [PIPERIDINE AND PYRROLIDINE-2,3′(2′H)QUINOLINE]-2′-ONE COMPOUNDS

Hideo Kato, and Eiichi Koshinaka, both of Fukui, Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyama, Japan

Filed Dec. 11, 1974, Ser. No. 531,452
Claims priority, application Japan, Dec. 19, 1973, 48-141177
Int. Cl.[2] C07D *215/38, 215/22*
U.S. Cl. 260—288 CE 3 Claims

1. A spiro compound of the formula:



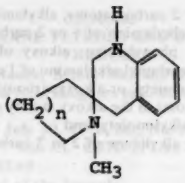
wherein *n* is an integer of 1 or 2, and the corresponding pharmaceutically acceptable acid addition salts thereof.

3,936,460
1′,4′-DIHYDRO-1-METHYL-SPIRO[PIPERIDINE AND PYROLIDINE-2,3′(2′H)QUINOLINE] COMPOUNDS

Hideo Kato, and Eiichi Koshinaka, both of Fukui, Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Fukui, Japan

Filed Dec. 10, 1974, Ser. No. 531,322
Claims priority, application Japan, Dec. 19, 1973, 48-141178
Int. Cl.[2] C07D *215/38*
U.S. Cl. 260—288 CE 3 Claims

1. A spiro-compound of the formula:



wherein *n* stands for an integer of 1 or 2, and the corresponding pharmaceutically acceptable acid addition salts.

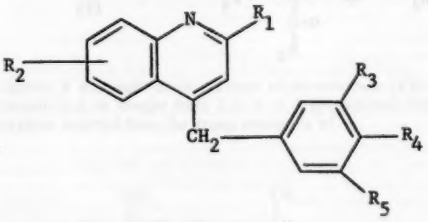
3,936,461

SUBSTITUTED 4-BENZYLQUINOLINES

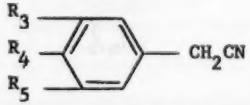
Charles F. Schwender, Lebanon, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 400,102, Sept. 24, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,764
Int. Cl.[2] C07D *215/12, 215/14*
U.S. Cl. 260—289 R 1 Claim

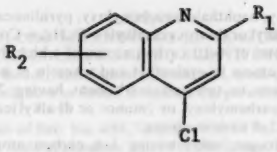
1. A process for producing compounds of the formula:



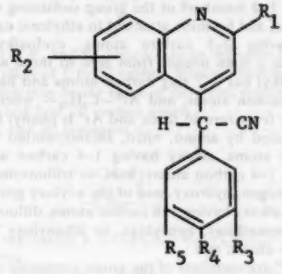
wherein R_1 is hydrogen or alkyl having 1 to 6 carbon atoms, R_2 is hydrogen, halogen, dialkoxy having 1 to 6 carbon atoms in the alkyl residues or methylendioxy, R_3 and R_4 are simultaneously alkoxy having 1 to 6 carbon atoms in the alkyl residue and R_5 is hydrogen or alkoxy having 1 to 6 carbon atoms in the alkyl residue which comprises (a) generating the carbanion of 1.0 molar-equivalent of a R_3, R_4, R_5-substituted phenylacetonitrile of the formula:



wherein R_3, R_4 and R_5 are as hereinbefore defined with about 1.5 molar-equivalents of sodium amide in liquid ammonia at about −25°C. to −30°C., (b) reacting the carbanion so generated with about 0.3 molar-equivalents of a R_1, R_2-substituted-4 -chloroquinoline of the formula:



wherein R_1 and R_2 are as hereinbefore defined at about −25°C. to −30°C., (c) recovering the R_1, R_2, R_3, R_4, R_5-substituted-α-(4-quinolinyl)-α-phenylacetonitrile intermediate of the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are as hereinbefore defined by extraction, (d) heating the s o obtained α-(4-quinolinyl)-α-phenylacetonitrile with 1-butanol saturated with hydrogen chloride under reflux and (e) recovering the product by extraction.

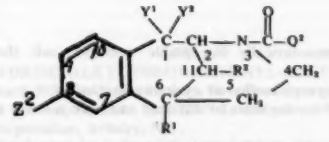
3,936,462

1,2,3,4,5,6-HEXAHYDRO-1-OXO OR HYDROXY-3-ACYL-,6-METHANO-3-BENZAZOCINES AND CORRESPONDING 1-ESTERS THEREOF

Noel F. Albertson, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 257,343, May 26, 1972, Pat. No. 3,823,149, which is a continuation-in-part of Ser. No. 43,556, June 4, 1970, abandoned. This application June 14, 1973, Ser. No. 369,870
Int. Cl.[2] C07D *221/26*
U.S. Cl. 260—293.54 11 Claims

1. 1,2,3,4,5,6-Hexahydro-1-(Y^1)-1-(Y^2)-3-(Q^2-CO-)-8-(Z^2)-6-(R^1)-11-(R^2)-2,6-methano-3-benzazocine having the formula



wherein:

Y^1 is hydroxy or acyloxy of the group consisting of: alkanoyloxy having 1–22 carbon atoms; alkenoyloxy having one or two double bonds and having 4–22 carbon atoms; $Ar—C_mH_{2m}—CO—O—$ wherein *m* is an integer from zero to two and Ar is phenyl or is phenyl substituted by 1–3 members of the group consisting of alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, halo, trifluoromethyl, dialkylamino having 2–8 carbon atoms, and alkanoylamino having 1–6 carbon atoms; phenox-

yacetoxy; naphthalenecarbonyloxy; pyridinecarbonyloxy; (cycloalkyl or fluorocycloalkyl)—C_mH_{2m}—Co—O— having a total of 4–10 carbon atoms of which 3–7 are ring carbon atoms in cycloalkyl and wherein m is an integer from zero to two, alkylcarbonato having 2–7 carbon atoms, carbamyloxy, or (mono- or di-alkyl)carbamyloxy having 2–9 carbon atoms;

Y^2 is hydrogen, alkyl having 1–6 carbon atoms, or Ar^1—C_nH_{2n}— wherein n is an integer from zero to four and Ar^1 is phenyl or phenyl substituted by 1–3 members of the group consisting of alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, and dialkylamino having 2–8 carbon atoms; or

Y^1 and Y^2 taken together represent oxo or ethylenedioxy;

Q^2 is alkyl having 1–7 carbon atoms, alkenyl having 2–5 carbon atoms, haloalkenyl having 2–5 carbon atoms and having 1–3 members of the group consisting of chlorine, fluorine, and bromine attached to ethylenic carbon, alkynyl having 2–5 carbon atoms, cycloalkyl—C_qH_{2q}— wherein q is an integer from zero to three and wherein cycloalkyl has 3–7 ring carbon atoms and has a total of 3–10 carbon atoms, and Ar^2—C_qH_{2q}— wherein q is an integer from zero to three and Ar^2 is phenyl or is phenyl substituted by amino, nitro, alkanoylamino having 1–6 carbon atoms, alkoxy having 1–4 carbon atoms, alkyl having 1–4 carbon atoms, halo, or trifluoromethyl;

Z^2 is hydrogen, hydroxy, one of the acyloxy groups defined by Y^1, alkoxy having 1–6 carbon atoms, difluoromethoxy, trifluoromethoxy, benzyloxy, or alkenyloxy having 3–6 carbon atoms; and

R^1 and R^2 are members of the group consisting of hydrogen and alkyl having 1–4 carbon atoms.

3,936,463

BENZOMORPHANES

Otto Behner; Ulrich Horlein; Friedrich Hoffmeister, and Hans Werner Schubert, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

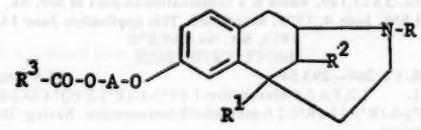
Filed Dec. 3, 1973, Ser. No. 421,439

Claims priority, application Germany, Dec. 7, 1972, 2259979

Int. Cl.² C07D 221/26

U.S. Cl. 260—293.54 **25 Claims**

1. A benzomorphan of the formula



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is cyclopropylmethyl or cyclobutylmethyl;

R^1 and R^2 are the same or different and each is lower alkyl; and

R^3 is straight- or branched-chain alkyl of 1 to 6 carbon atoms, straight- or branched-chain alkenyl of 2 to 6 carbon atoms or cycloalkyl of 3 to 6 carbon atoms unsubstituted or substituted by alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 1 to 4 carbon atoms in the alkoxy moiety, phenoxy, alkoxycarbonylamino of 1 to 4 carbon atoms in the alkoxy moiety or alkoxycarbonyl-alkylamino of 1 or 2 carbon atoms in the alkoxy moiety and 1 or 2 carbon atoms in the alkyl moiety; phenyl or pyridyl unsubstituted or substituted by hydroxy, alkyl of 1 or 2 carbon atoms, alkoxy of 1 or 2 carbon atoms or alkylamino of 1 or 2 carbon atoms; alkylamino of 1 or 2 carbon atoms, dialkylamino of 1 or 2 carbon atoms in each alkyl moiety; phenylamino; alkoxy of 1 or 2 carbon atoms; alkoxycarbonyl-alkylamino of 1 or 2 carbon atoms in the alkoxy moiety; or alkoxycarbonyl-alkylamino of 1 or 2 carbon atoms in the alkoxy moiety and 1 or 2 carbon atoms in the alkyl moiety; and

A is alkylene or alkylidene of 2 to 7 carbon atoms.

3,936,464

1-ACYL-3-[2-(4-PHENYL-1-PIPERIDINYL)ETHYL]INDOLINES

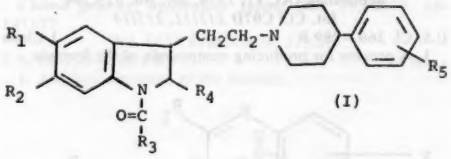
George Rodger Allen, Jr., Old Tappan, N.J., and Francis Joseph McEvoy, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 25, 1974, Ser. No. 518,023

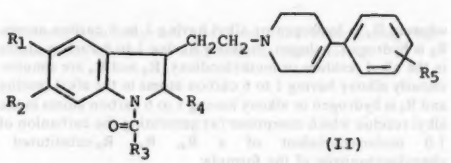
Int. Cl.² C07D 401/06

U.S. Cl. 260—293.61 **10 Claims**

1. A compound selected from the group consisting of those of the formulae:



(I)



(II)

wherein R_1 is hydrogen or a lower alkoxy group, R_2 is hydrogen and R_1 and R_2 taken together is methylenedioxy, R_3 is a lower alkyl group, R_4 is hydrogen or a lower alkyl group, and R_5 is hydrogen, chloro or trifluoromethyl; and the pharmacologically acceptable acid-addition salts thereof.

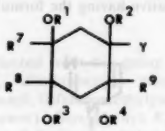
3,936,465

CYCLOHEXANE TETROLS AND DERIVATIVES THEREOF

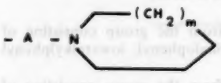
Frederic Peter Hauck, Somerville, and Joseph E. Sundeen, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 30, 1973, Ser. No. 383,642
Int. Cl.² C07D 211/32
U.S. Cl. 260—293.65 5 Claims

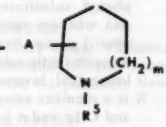
1. A compound of the formula



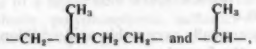
wherein Y is a radical of the formula



or



wherein A is straight-chain alkylene of the structure $(CH_2)_n$ wherein n is an integer from 1 to 6 or A is branched-chain alkylene selected from the group consisting of



m is 0 or 1, and R^5 is hydrogen, or alkyl of 1 to 3 carbons; R^1, R^2, R^3 and R^4 are the same or different and are alkanoyl of 1 to 4 carbons; haloalkanoyl of 1 to 4 carbons; or alkoxycarbonyl of the formula

wherein R is an alkyl radical of 1 to 4 carbons;
R^7 and R^8 are the same or different and are hydrogen or alkyl having 1 to 4 carbon atoms; and
R^9 is hydrogen or a straight or branched chain alkyl radical having 1 to 6 carbon atoms.

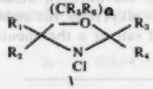
3,936,466

3-CHLORO-TETRAHYDRO-1,3-OXAZINES OR OXAZOLIDINES SPIRO SUBSTITUTED

Nicolae S. Bodor, and James J. Kaminski, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Division of Ser. No. 456,744, April 1, 1974, Pat. No. 3,897,425. This application Apr. 10, 1975, Ser. No. 566,746
Int. Cl.² C07D 221/20
U.S. Cl. 260—293.66 3 Claims

1. A 3-chloro-tetrahydro-1,3-oxazine or oxazolidine compound of the formula:



where each of R_1 and R_2, which may be the same or different, represents alkyl of 1 to 20 carbon atoms; wherein each of R_3 and R_4, which may be the same or different, represents hydrogen or alkyl of 1 to 20 carbon atoms.
wherein R_3 and R_4 represent a

group,
wherein Y represents a $-(CH_2)_n-W-(CH_2)_m-$ group or a >CH-Z group,
wherein W represents a member selected from the group consisting of a —O— atom, a $-CH_2-$ group, a $>NCH_3$ group, a $>NHCH_3^+$ group, a $>NC_2H_5$ group, a $>NHC_2H_5^+$ group, a $>N(CH_3)_2$ group, or a $>N(C_2H_5)_2$ group, wherein n is the same or different from *m* and wherein each of *n* and *m* represent an integer of from 0 to 2, and wherein Z is a member selected from the group consisting of a dimethylamino group, a diethylamino group, a trimethylammonium group, a triethylammonium group, a dimethylammonium group, a diethylammonium group, a $-COOR_7$ group, a $-OOCR_8$ group and a $-OR_9$ group, wherein each of R_7 through R_9, respectively, represents an alkyl group of from 1 to 5 carbon atoms or a benzyl group; and wherein *l* represents an integer of 1 or 2.

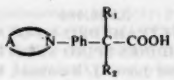
3,936,467

HYDROXYALKYLENIMINO-PHENYL-ACETIC ACIDS

Richard William James Carney, New Providence, and George de Stevens, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 307,698, Nov. 17, 1972, which is a continuation-in-part of Ser. No. 808,343, March 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 790,863, Jan. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 757,136, Sept. 3, 1968, Pat. No. 3,657,230, which is a continuation-in-part of Ser. No. 716,347, March 27, 1968, abandoned. This application Mar. 25, 1974, Ser. No. 454,643
Int. Cl.² C07D 211/40
U.S. Cl. 260—293.82 5 Claims

1. A compound of the formula



in which R_1 is hydrogen, R_2 is hydrogen, lower alkyl or 3 to 7 ring-membered cycloalkyl, Ph is 1,3- or 1,4-phenylene, (lower alkyl)-1,3- or 1,4-phenylene, (lower alkoxy)-1,3- or 1,4-phenylene, mono- or di-(halogeno)-1,3- or 1,4-phenylene, (trifluoromethyl)-1,3- or 1,4-phenylene, or (di-lower alkylamino)-1,3- or 1,4-phenylene, the group is 5 to 8 ring-membered hydroxyalkyleneimino, wherein the oxygen atom is separated from the nitrogen atom by at least two carbon atoms, or a lower alkyl ester, the amide, an alkali metal or alkaline earth metal salt or a therapeutically useful acid addition salt thereof.

3,936,468

PHENYLBUTANOL DERIVATIVES

Hisao Yamamoto, Nishinomiya; Masaru Nakao; Kikuo Sasajima, both of Toyonaka; Isamu Maruyama, Minoo, and Shigenari Katayama, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 82,100, Oct. 19, 1970, abandoned. This application Feb. 15, 1973, Ser. No. 332,777

Claims priority, application Japan, Oct. 27, 1969, 44-86175; Nov. 4, 1969, 44-88513; Feb. 3, 1970, 45-9688; Feb. 6, 1970, 45-10930; Feb. 9, 1970, 45-11629; Apr. 17, 1970, 45-33362

Int. Cl.² C07D *211/52*

U.S. Cl. 260—293.84 **4 Claims**

1. 1-(p-Fluorophenyl)-4-[4-(p-chlorophenyl)-4-hydroxypiperidino]-1-butanol or its non-toxic, pharmaceutically acceptable acid addition salt.

3,936,469

PROCESS FOR PREPARING N-CARBOXYLIC ANHYDRIDES OF AMINO ACIDS

Yasuo Fujimoto, Yokohama; Keizo Tatsukawa, Machida; Yoichi Koiwa, Tokyo; Akira Miike, Machida; Tatsuo Nomura, Tokyo, and Shohei Kobayashi, Kooriyama, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1973, Ser. No. 415,016

Claims priority, application Japan, Nov. 13, 1972, 47-112891; Jan. 31, 1973, 48-11924

Int. Cl.² C07D *263/44*

U.S. Cl. 260—307 B **5 Claims**

1. A process for preparing N-carboxylic anhydrides of amino acids comprising the step of reacting an amino acid selected from the group consisting of glycine, alanine, leucine, isoleucine, valine, proline, phenylalanine, cysteine, O-tert-butylserine, O-tert-butylthreonine, O-benzylserine, O-benzylthreonine, O-benzyltyrosine, S-benzylcysteine, methyl aspartate, ethyl asparate, propyl aspartate, methyl glutamate, ethyl glutamate, propyl glutamate, butyl glutamate, benzyl glutamate, N-acetyllysine, N-carbobenzoxylysine, N-carbobenzoxyornithine, arginine, cystine, methionine, and salts thereof; with trichloromethylchloroformate in an amount of from about 0.75 to 2.1 moles per mol of the amino acid at a temperature of from 30° to 150°C in an organic solvent selected from the group consisting of benzene, toluene, xylene, dichloromethane, 1,2-dichloropropane, 1,1,1-trichloroethane, tetrachloroethane, trichloroethylene, perchloroethylene, chlorobenzene, dichlorobenzene, chlorotoluene, benzylchloride, fluorobenzene, fluorotoluene, nitrobenzene, nitrotoluene, methyl acetate, ethyl acetate, propyl acetate, butyl acetate, methyl formate, ethyl formate, propyl formate, butyl formate, acetonitrile, propionitrile, tetrahydrofuran, 1,4-dioxane, propyl ether, chloroethyl ether, ethyleneglycol diethyl ether, methyl ethyl ketone, methyl isobutyl ketone, mixtures of dioxane with 1,2-dichloroethane, dioxane with methylenechloride, dioxane with chloroform, 1,2-dichloroethane with ethylacetate, 1,2-dichloroethane with tetrahydrofuran, chloroform with ethylacetate, benzene with tetrahydrofuran, and toluene with tetrahydrofuran.

3,936,470

1,3-DIOXOLAN-2-YLMETHYLIMIDAZOLES

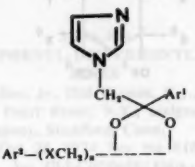
Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Jan. 27, 1975, Ser. No. 544,157

Int. Cl.² C07D *233/60, 405/10*

U.S. Cl. 260—309 **6 Claims**

1. A chemical compound selected from the group consisting of an imidazole derivative having the formula:



and the therapeutically active acid addition salts and stereochemical optical isomeric forms thereof,

wherein:

Ar^1 is a member selected from the group consisting of phenyl, mono-, di- and trihalophenyl, loweralkylphenyl and loweralkoxyphenyl;

Ar^2 is a member selected from the group consisting of phenyl, substituted phenyl, naphthyl and halonaphthyl, and wherein substituted phenyl has the meaning of a phenyl group, having thereon from 1 to 3 substituents, independently selected from the group consisting of halo, loweralkyl, loweralkoxy, cyano, phenyl and benzyl;

X is a member selected from the group consisting of O, S and CH_2; and n is the integer 0 or 1.

3,936,471

(HEXAHYDROBENZIMIDAZOL-2-YL)BENZOPHENONES AND DERIVATIVES

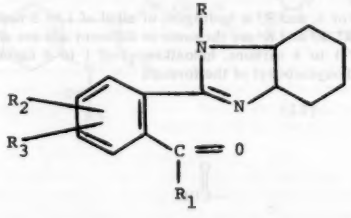
Theodore S. Sulkowski, Wayne, and Albert A. Mascitti, Norristown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 7, 1974, Ser. No. 495,358

Int. Cl.² C07D *49/34*

U.S. Cl. 260—309.6 **7 Claims**

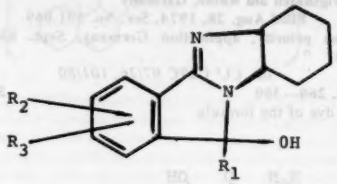
1. The pharmaceutically acceptable acid addition salt of a compound having the formula



wherein R is hydrogen or lower alkyl, R_1 is selected from the group consisting of phenyl, monohalophenyl, dihalophenyl, mono(lower)alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl, di(lower)alkoxyphenyl; R_2 is selected from the group consisting of hydrogen, halogen,(lower)alkyl and (lower)alkoxy; R_3 is hydrogen when

R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of hydrogen, halogen (lower)alkyl and (lower)alkoxy.

6. A compound of the formula:



wherein R_1 is selected from the group consisting of phenyl, monohalophenyl, dihalophenyl, mono(lower)alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl, di(lower) alkoxyphenyl; R_2 is selected from the group consisting of hydrogen, halogen, (lower)alkyl and (lower)alkoxy; R_3 is hydrogen when R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of hydrogen, halogen, (lower)alkyl and (lower)alkoxy.

3,936,472
LACTONE ACID SYNTHESIS

Robert Earl Kinney, Lawrenceville; Albert Lloyd Williams, Hopewell Township, and El-Ahmadi Ibrahim Heiba, Princeton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1973, Ser. No. 324,939
Int. Cl.² C07D *307/28*
U.S. Cl. 260—343.6 **14 Claims**

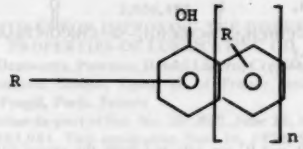
1. A method of producing a lactone ester comprising the step of mixing alkenylsuccinic anhydride, wherein the alkenyl group has from 14 to 190 carbon atoms, with an organic compound having the formula $R'''(XH)_p$, wherein p is from 1 to 4, X is selected from the group consisting of oxygen sulfur and, R''' is alkyl having from 1 to 8 carbon atoms, in the presence of an acid-acting catalyst selected from the group consisting of a liquid acid selected from the group consisting of phosphoric, polyphosphoric, sulfonic, p-toluene sulfonic, phosphonic and hydrogen halide, a cation exchange resin, a crystalline aluminosilicate at least partially in the hydrogen form, and forming said lactone ester.

3,936,473
VINYLATION OF AROMATIC COMPOUNDS

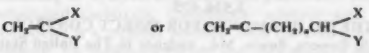
Ted Symon, Lombard, and Nils J. Christensen, Palatine, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 9, 1973, Ser. No. 387,087
Int. Cl.² C07D *311/08, 311/10*
U.S. Cl. 260—343.2 R **12 Claims**

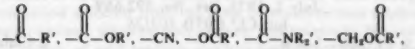
1. In a process for the preparation of a coumarin which comprises reacting a hydroxy substituted aromatic compound possessing the generic formula:



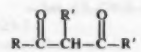
in which R is selected from the group consisting of hydrogen, hydroxyl, alkyl, alkoxyl, aryl, alkaryl, aralkyl, cycloalkyl and halogen radicals and n is an integer of from 0 to about 2 with an ethylenic compound which possesses the generic formula:



in which X and Y are selected from the group consisting of hydrogen, alkyl,



and OR′ radicals, R′ being selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, aralkyl, alkaryl radicals and n is an integer of from 0 to about 16 at a temperature in the range of from about ambient to about 250° C. and a pressure in the range of from atmospheric to about 500 atmospheres in the presence of a catalyst system comprising an acetylacetonate or carboxylate salt of copper or a noble metal of Group VIII of the Periodic Table, oxygen, and organic acid and recovering the resultant coumarin compound, the improvement which comprises effecting said vinylation reaction in the presence of a compound containing an active methylene group selected from the group consisting of lower alkyl acetoacetate; lower alkyl propioacetate; lower alkyl butyroacetate; diloweralkyl malonate: β-diketones possessing the generic formula:



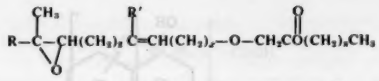
in which R and R′ comprise alkyl containing compounds from 1 to about 4 carbon atoms and R′′ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkaryl and aralkyl radicals and benzyl ketones present in a range of from about 0.1:1 to about 10:1 moles of said active methylene group-containing compound per mole of noble metal of Group VIII of the Periodic Table or copper.

3,936,474
SYNTHETIC HORMONES FOR INSECT CONTROL

William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 363,294, May 23, 1973, which is a division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application July 2, 1975, Ser. No. 592,686
Int. Cl.² C07D *303/40*
U.S. Cl. 260—348 A **2 Claims**

1. A compound of the general formula



wherein R and R′ are selected from the group consisting of methyl and ethyl; x is a number from 1 to 2; and n is a number from 0 to 3.

3,936,475

SYNTHETIC HORMONES FOR INSECT CONTROL

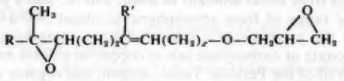
William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 363,294, May 23, 1973, which is a division of Ser. No. 78,577, Oct. 5, 1969, abandoned. This application July 2, 1975, Ser. No. 592,689

Int. Cl.² C07D *303/28*

U.S. Cl. 260—348 R 2 Claims

1. A compound of the general formula



wherein R and R′ are selected from the group consisting of methyl and ethyl; and x is a number from 1 to 2.

3,936,476

SILICONE COMPOSITIONS CONTAINING PLATINUM-CONTAINING MATERIAL AND MANGANESE CARBONATE

Kunio Itoh, and Takeo Yoshida, both of Annaka, Japan, assignors to Shinetsu Chemical Company, Japan

Continuation-in-part of Ser. No. 332,495, Feb. 14, 1973, abandoned. This application Jan. 8, 1975, Ser. No. 539,428

Claims priority, application Japan, Feb. 14, 1972, 47-15479

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB 4 Claims

1. Silicone compositions which comprise

a. 100 parts by weight of an organopolysiloxane having the formula:

$R_aSiO_{4-a/2}$

wherein R is a member selected from the group consisting of substituted and unsubstituted monovalent hydrocarbon radicals; and a is a number from about 1.90 to about 2.05;

b. from about 20 to about 200 parts by weight of finely divided silica filler,

c. from about 5 to about 100 parts by weight of manganese carbonate having a particle size of from about 1μ to about 50μ and

d. from about 5 to about 1,000 parts per million parts by weight of a platinum-containing composition, at least a part of which is platinum, the parts of platinum in said composition being based on the weight of the said organopolysiloxane component (a).

3,936,477

BLUE ANTHRAQUINOID DISPERSE DYES, THEIR PRODUCTION AND USE

Karl Maier, Ludwigshafen, and Ernst Hartwig, Heidelberg, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhine, Germany

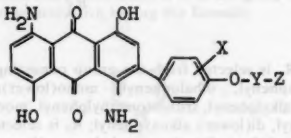
Filed Aug. 28, 1974, Ser. No. 501,069

Claims priority, application Germany, Sept. 13, 1973, 2346047

Int. Cl.² C07C *97/26, 101/80*

U.S. Cl. 260—380 5 Claims

1. A dye of the formula:



in which

X is hydrogen, chloro, methyl, methoxy or ethoxy;

Y is saturated alkylene of two to eight carbon atoms or —$(CH_2)_2$—O—$(CH_2)_2$—;

and

Z is —CN or —COOH.

3,936,478

PROCESS FOR THE PREPARATION OF DESMOSTEROL DERIVATIVES

Toru Takeshita, Hino, and Sachio Ishimoto, Tokyo, both of Japan, assignors to Teijin Limited, Osaka, Japan

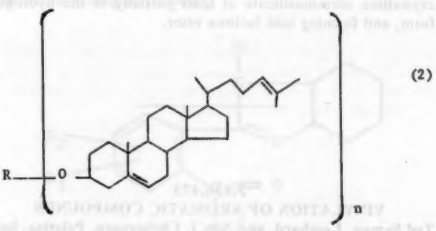
Filed June 19, 1974, Ser. No. 480,823

Claims priority, application Japan, June 20, 1973, 48-68657; July 3, 1973, 48-74367

Int. Cl.² C07J *9/00*

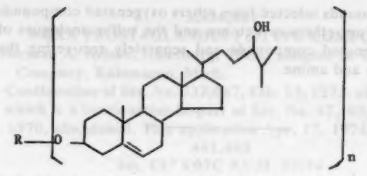
U.S. Cl. 260—397.2 10 Claims

1. A process for the preparation of desmosterol of which the hydroxyl group at the 3-position is protected, or bis-form derivatives thereof, of the formula (2) below:



(2)

in which R denotes respectively a monovalent or divalent protective group which is convertible into a hydroxyl group through hydrolysis or reduction, and n is respectively 1 or 2, which comprises reacting 24-hydroxycholesterol of which the hydroxyl group at the 3-position is protected, or bis-form derivatives thereof, of the formula (1) below:



(1)

in which R and *n* have the same definitions as given for formula (2), with a dehydrating agent selected from the group consisting of

(A)(1) phosphorus pentoxide, (A)(2) acid potassium sulfate,

(B)(1) phosphorus oxychloride, (B)(2) thionyl chloride, and (B)(3) sulfonyl chlorides, with the proviso that when the dehydrating agent is (B)(1), (B)(2) or (B)(3) it is used in the presence of tertiary amine.

3,936,479

ORGANIC COMPOUNDS

Lajos Avar, Binningen, Basel-Land; Kurt Hofer, Munchenstein, Basel-Land, and Martin Preiswerk, Basel, all of Switzerland, assignors to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

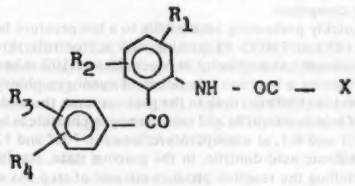
Filed May 4, 1973, Ser. No. 357,375

Claims priority, application Switzerland, May 9, 1972, 6864/72

Int. Cl.² C07C *103/42, 103/62, 103/80*

U.S. Cl. 260—404 **26 Claims**

1. A compound of the formula:



wherein

R_1, R_2, R_3 and R_3 are independently, hydrogen or alkyl of 1 to 4 carbon atoms, and

X is phenyl which is substituted by hydroxy and 1 or 2 alkyls of 1 to 4 carbon atoms, or by alkoxy of 1 to 4 carbon atoms and 1 to 2 alkyls of 1 to 4 carbon atoms, or by phenyl sulphoxide; styryl; or phenylalkyl of 8 carbon atoms which is substituted by hydroxy and 1 or 2 alkyls of 1 to 4 carbon atoms.

3,936,480

ADDITIVES FOR IMPROVING THE DISPERSING PROPERTIES OF LUBRICATING OIL

Bernard Demoures, Puteaux; Daniel Llauro, Crepieux-le-Pape, and Francois Giolito, Lyon, all of France, assignors to Rhone-Progil, Paris, France

Continuation-in-part of Ser. No. 267,048, June 28, 1972, Pat. No. 3,862,981. This application Nov. 16, 1972, Ser. No. 307,062

Claims priority, application France, July 8, 1971, 71.26025; Nov. 17, 1971, 71.41972

Int. Cl.² C10L *1/22;* **C10M** *3/26*

U.S. Cl. 260—404.5 **7 Claims**

1. An additive comprising the reaction product of a hydroxyl compound with a member selected from the class consisting of hydrocarbon chain and chlorinated polyolefin - substituted carboxylic compounds, wherein said hydroxyl compound is a member selected from the class consisting of aliphatic, cycloaliphatic mono- and poly-alcohols and phenolic compounds, wherein said hydrocarbon chain and said chlorinated polyolefin substituent are substantially saturated and contain at least about 30 carbon atoms, which reaction product is neutralized wholly with an ashless basic nitrogen compound selected from the class of aromatic and aliphatic mono-amines, alkylene poly-amines, and ammonia, the residual acidity of said reaction product being such that its total neutralization is accomplished by the addition of sufficient ashless basic nitrogen compound to impart a nitrogen content of between about 0.9% and 2.5% by weight of the final product.

3,936,481

HYDRAZONO-1,3,2-DITHIARSETANES, -STANNETANES AND -STIBITANES

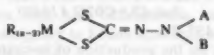
William Lindsay Mosby, North Plainfield, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 1, 1973, Ser. No. 412,000

Int. Cl. C07f *7/22*

U.S. Cl. 260—429.7 **7 Claims**

1. A compound of the formula:



wherein M is a polyvalent metal selected from the group consisting of antimony, arsenic and tin; R is a monovalent hydrocarbyl radical selected from the group consisting of lower alkyl, mono or bicyclic aromatic, and monocyclic aralkyl; *n* is an integer of 3 when M is arsenic or antimony and 4 when M is tin; A is lower alkyl, —CO—aryl or —SO_2—-aryl; B is hydrogen or lower alkyl; and aryl is monocyclic.

3,936,482

ORGANO TIN COMPOUNDS USEFUL AS CATALYSTS IN THE POLYCONDENSATION OF ORGANOSILICON COMPOUNDS

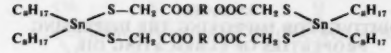
Ferenc Sagi, Bron, and Michel Roussos, Lyon, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Division of Ser. No. 237,514, March 23, 1972, Pat. No. 3,819,673. This application Apr. 29, 1974, Ser. No. 465,075

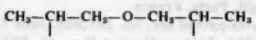
Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **3 Claims**

1. Organothio-tin compounds of the general formula



in which R represents a p-xylylene radical or a



radical.

3,936,483

ORGANIC POLYISOCYANATES

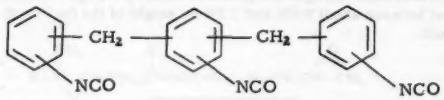
Gemeinhardt, Paul G., Pittsburgh, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 358,633, April 9, 1964, abandoned. This application July 28, 1970, Ser. No. 64,091

Int. Cl.[2] C07C *119/048*

U.S. Cl. 260—453 AR 6 Claims

1. A composition comprising a mixture of from about 10 per cent to about 90 per cent by weight of toluylene diisocyanate selected from the group consisting of 2,4-toluylene diisocyanate, 2,6-toluylene diisocyanate and mixtures thereof and the balance a polyphenylpolymethylene-polyisocyanate comprising a mixture of from about 40 per cent to about 60 per cent diphenylmethane diisocyanate, from about 20 per cent to about 30 per cent of triisocyanate having the formula



and the balance higher functional polyphenyl-poltmethylene-polyisocyanates.

3,936,484

PRODUCTION OF ISOCYANATES FROM SUBSTITUTED UREAS

Rudolph Rosenthal, Broomall, and John G. Zajacek, Strafford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 25, 1974, Ser. No. 508,972

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P 12 Claims

1. A method for the production of isocyanates from di- and tri-substituted ureas having the formula $R(NHCONR'R''')_x$ wherein R is a substituted or unsubstituted mono-, di- or trivalent organic radical selected from the group consisting of a saturated or mono-olefinic unsaturated straight or branched chain aliphatic or cycloaliphatic radical containing not more than 32 carbon atoms, an alkoxyalkyl radical having not more than 32 carbon atoms, an aryl radical, and an alkaryl radical containing 1 to 5 rings; R′ and R″ are the same or different and are the same radicals enumerated for R; R′ and R″ but not both may be hydrogen; and *x* is an integer of from 1 to 3, which comprises thermally decomposing said urea at a temperature in the range of from 230°C. to 350°C. while said urea is dissolved in an inert reaction medium solvent to produce the isocyanate and corresponding amine, said reaction medium solvent being higher boiling than the isocyanate product and selected from the group consisting of high molecular weight aliphatic, cycloaliphatic, and aromatic hydrocarbons or substituted hydrocarbons and in the presence of an inert carrier agent consisting of an inert carrier gas or inert carrier solvent or mixtures thereof, said inert carrier gas being selected from the group consisting of nitrogen, helium, argon, methane, ethane and propane, said inert carrier solvent being lower boiling than the isocyanate product and selected from the group consisting of lower boiling aliphatic, cycloaliphatic or aromatic hydrocarbons, substituted hydrocarbons, oxygenated compounds selected from ethers oxygenated compounds selected from ethers or ketones and the sulfur analogues of said oxygenated compounds and separately recovering the isocyanate and amine.

3,936,485

SUBSTITUTED SULFONYLGLYCOLIC ACID ANILIDES

Wolfgang Rohr, Mannheim, and Adolf Fischer, Mutterstadt, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

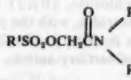
Division of Ser. No. 310,640, Nov. 29, 1972, Pat. No. 3,865,860. This application Oct. 7, 1974, Ser. No. 512,669

Claims priority, application Germany, Dec. 6, 1971, 2160380

Int. Cl.[2] C07C *143/24*

U.S. Cl. 260—456 A 4 Claims

1. A N-substituted sulfonylglycolic acid anilide of the formula



where R^1 denotes benzyl, phenyl or phenyl substituted by methyl or ethyl, halogen or nitro, R^2 denotes phenyl or phenyl substituted by alkyl of 1 to 3 carbon atoms, and R^3 denotes alkynyl of 3 to 6 carbon atoms.

3,936,486

PROCESS FOR THE PRODUCTION OF MALONIC ACID DINITRILE

Alfons Egger; Erich Widmer; Adriano Faucci, and Rolf Gregorin, all of Visp (Kanton Wallis), Switzerland, assignors to Lonza Ltd., Basel, Switzerland

Filed Oct. 18, 1974, Ser. No. 516,135

Claims priority, application Switzerland, Oct. 18, 1973, 14759/73

Int. Cl.[2] C07C *120/00, 121/22*

U.S. Cl. 260—465.8 R 30 Claims

1. The process for the production of malonic acid dinitrile which comprises:

a. quickly preheating acetonitrile to a temperature between 110° and 700°C. by passing said acetonitrile through a preheater at a velocity between 20 and 100 m/sec.;

b. reacting a reaction admixture of cyanogen chloride and said acetonitrile, both in the gaseous state, the molar ratio of said acetonitrile and said cyanogen chloride is between 1:1 and 6:1, at a temperature between 700° and 1200°C., malonic acid dinitrile, in the gaseous state, resulting;

c. chilling the reaction product mixture of step (b) which is comprised of said gaseous malonic acid dinitrile, said gaseous cyanogen chloride, said gaseous acetonitrile and HCl, a reaction byproduct, with liquid mixture, which is comprised of malonic acid dinitrile, cyanogen chloride, acetonitrile and HCl, to a temperature between 40°C. and the boiling point of said reaction product mixture, a liquid reaction product resulting;

d. simultaneously with step (c), refining the exhaust gas from said chilling of said reaction product mixture of step (c) whereby the cyanogen chloride and acetonitrile is separated from the HCl in the exhaust gas; and

e. isolating said malonic acid dinitrile from said liquid reaction product mixture and purifying said malonic acid dinitrile.

3,936,487

3-OXA PROSTAGLANDIN Fα-TYPE COMPOUNDS

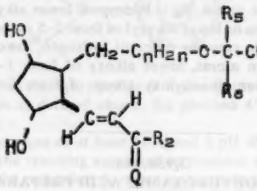
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 332,067, Feb. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 47,169, June 17, 1970, abandoned. This application Apr. 17, 1974, Ser. No. 461,483

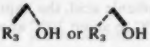
Int. Cl.² C07C 61/38, 69/74

U.S. Cl. 260—468 D 70 Claims

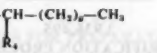
1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein C_nH_{2n} is alkylene of one to 10 carbon atoms, inclusive, with 1 to 5 carbon atoms, inclusive, between —CH_2— and —O—; wherein Q is



wherein R_3 is hydrogen or methyl; wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or ethyl substituted in the β-position with 3 chloro; wherein R_2 is



wherein R_4 is hydrogen or fluoro and g is one, 2, 3, 4, or 5; wherein R_5 and R_6 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,936,488

POLYCYCLIC DIOXABORIN COMPLEXES

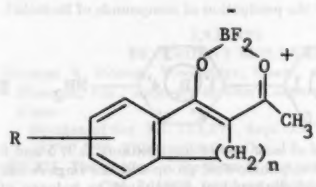
Daniel Kaminsky, Parsippany, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 351,912, April 18, 1973, Pat. No. 3,862,144. This application Oct. 17, 1974, Ser. No. 515,765

Int. Cl.² C07F 5/04

U.S. Cl. 260—462 R 8 Claims

1. Compounds of the formula III:



III

wherein R is hydrogen, lower alkyl, or lower acyloxy and *n* represents 1 or 2.

3,936,489

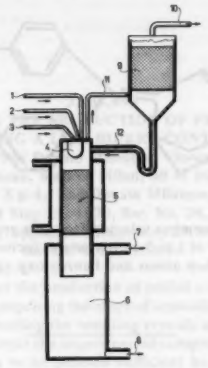
PROCESS AND EQUIPMENT FOR SOLVENT EXTRACTION

László Rózsa, Miskolc I.; Lajos Mészáros, Szeged, and Ferenc Mogyorodi, Miskolc I., all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Filed Nov. 13, 1972, Ser. No. 306,059

Int. Cl.² B01D 11/04; C07C 51/48, 68/08

U.S. Cl. 260—463 8 Claims



1. In a process for the solvent extraction of a component of a mother liquor comprising liquids that are immiscible with each other and have differing specific gravities, the improvement which comprises, in sequence: dispersing said liquids and a solvent by simultaneously atomizing them together with an atomizing gas through a spraying nozzle into an extraction chamber, then condensing the dispersion to terminate the disperse state, and separating the immiscible phases from each other.

3,936,490

PROCESS FOR CONDUCTING ORGANONITRILE ADDITION REACTIONS

John E. Hofmann, and Alan Schriesheim, both of Berkeley Heights, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 460,508, June 1, 1965, Pat. No. 3,595,930. This application Dec. 22, 1970, Ser. No. 100,811

Int. Cl.² C07C 120/00

U.S. Cl. 260—465.3 10 Claims

1. A process for preparing a tri substituted nitrile which comprises reacting acetonitrile with butadiene, at a temperature of from about 10° to 100°C for a period of from about 1 to 25 hours, in the presence of a basic alkali metal catalyst, said catalyst being selected from the group consisting of alkali metal hydrides, alkali metal organo amides, alkali metal alkoxides, alkali metal hydroxides, and alkali metal alkyls, said reaction taking place in a solvent selected from the group consisting of trimethyl phosphoramide, hexamethyl phosphoramide, tetramethyl urea, and N-methyl-2-pyrollidone.

3. A process for preparing dimethyl butenyl acetonitrile which comprises reacting isobutyronitrile with butadiene at a temperature of from about 10° to 100°C for a period of from 1 to 25 hours in the presence of a basic alkali metal catalyst, said catalyst being selected from the group consisting of alkali metal hydrides, alkali metal organo amides, alkali metal alkoxides, alkali metal hydroxides, and alkali metal alkyls, said reaction taking place in a solvent selected from the group consisting of trimethyl phosphoramide, hexamethyl phosphoramide, tetramethyl urea, and N-methyl-2-pyrollidone.

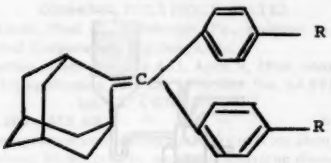
3,936,491

ADAMANTYLENE COMPOUNDS

Volkert Claassen, Weesp, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1968, Ser. No. 779,987
Claims priority, application Netherlands, Dec. 2, 1967, 6716437
Int. Cl.² C07C *39/16, 39/17, 43/20, 69/02*
U.S. Cl. 260—479 R 7 Claims

1. An adamantylidene compound of the formula



wherein R is a member selected from the group consisting of hydroxy, alkoxy of 1 to 3 carbon atoms inclusive, alkanoyloxy of up to 20 carbon atoms and benzoyloxy.

3,936,492

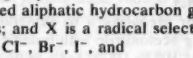
MONOMERIC EMULSION STABILIZERS

Carlos M. Samour, Wellesley Hills, and Mildred C. Richards, Wakefield, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Division of Ser. No. 272,282, July 17, 1972, abandoned, which is a division of Ser. No. 867,899, Oct. 20, 1969, Pat. No. 3,780,092. This application Aug. 9, 1974, Ser. No. 496,320
Int. Cl.² C07C *87/30*
U.S. Cl. 260—482 R 3 Claims

1. Compounds corresponding to the formula

wherein V is selected from the class consisting of vinyl acetoxy, (CH_2=CH—O—CO—CH_2—), allyl acetoxy, (CH_2=CH—CH_2—O—CO—CH_2—), and methallyl acetoxy (CH_2=C(CH_3)—CH_2—O—CO—CH_2—) groups;
R_1 and R_2 are selected from the class consisting of benzyl groups and alkyl groups of from 1 to 7 carbon atoms; R_3 is a lipophilic saturated aliphatic hydrocarbon group of from 7 to 28 carbon atoms; and X is a radical selected from the class consisting of F^-, Cl^-, Br^-, I^-, and



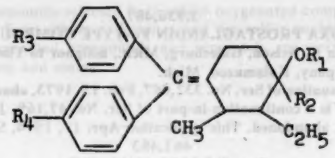
3,936,493

DIARYLMETHYLENES

George Karmas, Bound Brook, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Apr. 17, 1973, Ser. No. 351,940
Int. Cl.² C07C *69/02, 69/14*
U.S. Cl. 260—488 CD 6 Claims

1. A compound of the formula:



wherein R_1 is hydrogen or —COR wherein R is lower alkyl of from 1–5 carbon atoms, R_2 is hydrogen, lower alkyl of from 1–5 carbon atoms or lower alkynyl of from 2–5 carbon atoms, R_3 and R_4 are the same or different hydrogen, lower alkyl of from 1–5 carbon atoms, lower alkoxy of from 1–5 carbon atoms or a lower alkanoyloxy group of from 2–5 carbon atoms.

3,936,494

NAPHTHENOHYDROXAMIC ACID PREPARATION

Stanley A. Lipowski, Livingston, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Sept. 25, 1974, Ser. No. 509,283
Int. Cl.² C07C *119/00*
U.S. Cl. 260—500.5 H 9 Claims

1. In a process for producing naphthenohydroxamic acid from an ester of napthenic acid, the improvement comprising reacting at about 25°C to about 30°C about equimolar quantities of
   a. ester of naphthenic acid,
   b. hydroxylamine dissolved in an alcohol/water/alkali metal sulfate slurry wherein the water content of the slurry is insufficient to hydrolyze the ester during conversion to naphthenohydroxamic acid, and
   c. an alkali metal hydroxide dissolved in alcohol.

3,936,495

PURIFICATION PROCESS

Alan P. Sullivan, Jr., Lebanon, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 27, 1973, Ser. No. 419,304
Int. Cl.² C07C *143/28*
U.S. Cl. 260—501.12 2 Claims

1. The p-toluene sulfonic acid addition salt of α-hydrazino-α-methyl-β-(3,4-dihydroxyphenyl)propionic acid.

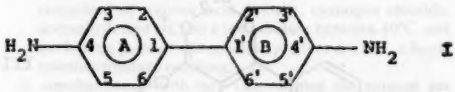
3,936,496

ORGANIC COMPOUNDS

Zdenek Allan, Allschwil, and August Schweizer, Muttenz, both of Switzerland, assignors to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

Filed Dec. 13, 1972, Ser. No. 314,675
Claims priority, application Switzerland, Dec. 15, 1971, 18353/71; Jan. 31, 1972, 1379/72; Feb. 17, 1972, 2297/72
Int. Cl.² C07C *143/56*
U.S. Cl. 260—510 9 Claims

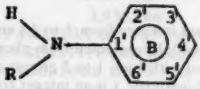
1. A process for the production of compounds of formula I,



in which in ring A at least one of the positions 2, 3, 5 and 6 is substituted by a sulphonic acid group and the rings A and B are otherwise unsubstituted or substituted by halogen of atomic number from 9 to 53 and/or by alkyl or alkoxy of 1 to 6 carbon atoms, which comprises reacting a compound of formula II,

II

in which the ring A is defined as above, the position 4 being unsubstituted, with a compound of formula III,



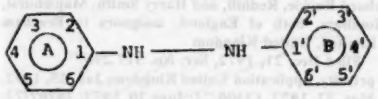
III

in which

R signifies methyl, ethyl or β-hydroxyethyl, and

ring B is as defined above, the position 4′ being unsubstituted,

at a temperature of at least 50°C and a pH of at least 12, and reducing the resulting azo reaction product, under conditions whereby the reduction does not proceed beyond the hydrazo stage, to a hydrazo compound of formula IV,



IV

in which rings A and B are as defined above, the positions 4 and 4′ being unsubstituted, and rearranging the compound of formula IV in a strongly acid medium to produce the compound of formula I.

3,936,497

PROCESS FOR PREPARATION OF 4,4′-DIAMINOSTILBENE-2,2′-DISULFONIC ACID OR SALTS THEREOF

Naonori Hirata, Toyonaka, and Masatoshi Matsuo, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 2, 1974, Ser. No. 528,658

Claims priority, application Japan, Dec. 3, 1973, 48-136563; Dec. 5, 1973, 48-136998

Int. Cl.² C07C *143/56*

U.S. Cl. 260—510 **7 Claims**

1. A process for preparing disodium 4,4′-diaminostilbene2,2′-disulfonate, which comprises reducing disodium 4,4′-dinitrostilbene-2,2′-disulfonate with hydrogen in the presence of a nickel metal catalyst in an aqueous medium at a temperature of 20° to 200°C in which the pH of the reaction system is adjusted to a range from 5 to 10 using a buffer.

3,936,498

DETERGENT BUILDERS

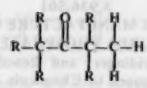
Herman A. Bruson, Woodridge, Conn., and Henry Gould, Houston, Tex., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 183,277, Sept. 23, 1971, Pat. No. 3,767,598. This application Oct. 15, 1973, Ser. No. 406,325. The portion of the term of this patent subsequent to Oct. 2, 1990, has been disclaimed.

Int. Cl.² C07C *55/24*

U.S. Cl. 260—537 R **3 Claims**

1. A detergent builder composition having the formula:



wherein R is $-CH_2-CH_2-COOX$, X being a member selected from the class consisting of hydrogen, alkali metals, and ammonium.

3,936,499

PROCESS FOR THE PRODUCTION OF PRILLED UREA HAVING A LOW BIURET CONTENT

Umberto Zardi, San Donato Milanese; Vincenzo Lagana, and Carlo Mantegazza, both of Milan, all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed May 21, 1970, Ser. No. 39,292

Claims priority, application Italy, May 29, 1969, 17499/69

Int. Cl.² C07C *126/00*

U.S. Cl. 260—555 C **2 Claims**

1. A process for the production of prilled urea having a low biuret content comprising the steps of crystallizing urea of low biuret content, melting the resulting crystals and pelleting the melted urea, wherein the improvement comprises supplying to the urea crystals to be pelleted sufficient heat to melt from only 30% to 70% of said crystals, forming therefrom a heterogeneous mixture of melted urea with crystals in suspension, and feeding said mixture to pelleting apparatus.

3,936,500

PROCESS FOR PREPARING UREA

Petrus J. C. Kaasenbrood, and Johannes D. M. Verstegen, both of Sittard, Netherlands, assignors to Unie Van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Filed June 12, 1973, Ser. No. 369,391

Claims priority, application Netherlands, June 12, 1972, 7207940

Int. Cl.² C07C *126/00*

U.S. Cl. 260—555 A **4 Claims**

1. In a continuous process for the preparation of urea wherein NH_3 and CO_2 are reacted at elevated temperature and pressure in a synthesis zone to continuously provide ammonium carbamate, thereafter converting the ammonium carbamate into a urea solution containing unconverted ammonium carbamate and stripping the carbamate from said solution in a stripping zone by decomposing the carbamate by continuously contacting said solution with a stripping gas at a temperature of about 180° to at most 200° C. and under a pressure of about 125 to at most 200 atm. continuously in said stripping zone, said urea synthesis zone and stripping zone being operated under substantially the same pressure, expelling the resulting NH_3, CO_2 and H_2O from said stripping zone, condensing the resulting mixture of stripping gas and gases expelled from said urea solution after addition of further NH_3 or CO_2 to form a carbamate solution, and returning the thus formed carbamate solution to said urea synthesis zone for further urea synthesis,

the improvement comprising conducting said urea synthesis and stripping zone at a pressure of at least 225 atm., and contacting said urea solution with said stripping gas at an initial temperature of at least 205° C, said stripping step occurring under substantially adiabatic conditions devoid of the addition of heat to said stripping zone.

3,936,501

PROCESS FOR THE MANUFACTURE OF CRYSTALLINE UREA PHOSPHATE

Dahlia Simeona Greidinger, and Benedict Cytter, both of Haifa, Israel, assignors to Chemicals & Phosphates, Ltd., Haifa, Israel

Filed May 7, 1974, Ser. No. 467,670
Claims priority, application Israel, June 29, 1973, 42624
Int. Cl.² C07C *126/00*
U.S. Cl. 260—555 R 5 Claims

1. An exothermic process for the direct manufacture of crystalline urea phosphate characterized in that solid urea is reacted stoichiometrically in equimolar quantities with orthophosphoric acid at a temperature of about 60°–90°C wherein said orthophosphoric acid contains above 90% H_3PO_4 by weight.

3,936,502

COPPER COMPOUND CATALYSTS FOR HYDRATION OF NITRILES TO AMIDES

William Austin Barber, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 30, 1972, Ser. No. 302,363
Int. Cl.² C07C *103/08*
U.S. Cl. 260—561 N 3 Claims

1. A process for production of acrylamide by hydration of acrylonitrile comprising contacting said nitrile in the presence of water with a solid heterogeneous catalyst selected from copper acetylide and copper nitride.

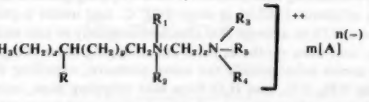
3,936,503

ARYL-SUBSTITUTED ALIPHATIC DIQUATERNARY COMPOUNDS

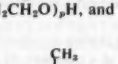
Eugene J. Miller, Jr., Wheaton, and Harlan E. Tiefenthal, Western Springs, both of Ill., assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 731,695, May 24, 1968, abandoned, which is a continuation-in-part of Ser. No. 502,563, Oct. 22, 1965, abandoned. This application Apr. 9, 1970, Ser. No. 27,161
Int. Cl.² C07C *87/30*
U.S. Cl. 260—567.6 P 17 Claims

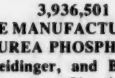
1. Diquaternary ammonium compounds represented by the formula



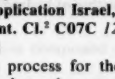
wherein R_1 and R_3 are selected from the group consisting of alkyl radicals having from 1 to 3 carbon atoms; R_2 is selected from the group consisting of alkyl radicals having from 1 to 3 carbon atoms, $-(CH_2CH_2O)_pH$, and



R_3 is selected from the group consisting of alkyl radicals having from 1 to 3 carbon atoms, $-(CH_2CH_2O)_wH$, and



R_4 is selected from the group consisting of alkyl radicals having from 1 to 3 carbon atoms, $-(CH_2CH_2O)_rH$, and



wherein p, r, and w are integers from 1 to 40 and the sum of p, r, and w is less than 80; R is selected from phenyl, naphthyl, and phenyl-substituted with from 1 to 2 groups selected from methyl, hydroxy, and methoxy; x is an integer from 0 to 18, y is an integer from 1 to 19, and the sum of x and y is an integer from 8 to 19; z is an integer from 2 to 6; A is an anion; m and n are integers from 1 to 2 and the product of m times n is 2; said compounds consisting of isomeric mixtures with respect to the position of attachment of R to the alkyl chain.

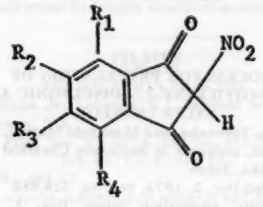
3,936,504

ANTI-ALLERGIC PHARMACEUTICAL COMPOSITIONS

Derek Richard Buckle, Redhill, and Harry Smith, Maplehurst, near Horsham, both of England, assignors to Beecham Group Limited, United Kingdom

Filed Dec. 21, 1972, Ser. No. 317,296
Claims priority, application United Kingdom, Jan. 25, 1972, 3348/72; Mar. 22, 1972, 13300/72; June 20, 1972, 28707/72; Oct. 18, 1972, 48027/72
Int. Cl.² C07C *49/76*, *49/80*, *49/84*
U.S. Cl. 260—590 D 21 Claims

1. A compound of the formula (I) or a pharmaceutically acceptable non-toxic salt thereof:



(I)

wherein

1 or 2 of R_1, R_2, R_3 and R_4 are methyl, ethyl, n-propyl, iso-propyl, n-butyl, sec-butyl, t-butyl, methoxy, ethoxy, n-propoxy, iso-propoxy, n-butoxy, sec-butoxy or t-butoxy and the remaining 2 or 3 are each hydrogen or one of R_1, R_2, R_3 and R_4 is fluoro, phenyl or benzyl and the remaining 3 are each hydrogen, or each of R_1, R_2, R_3 and R_4 is chloro, or R_1 and R_2, or R_2 and R_3, or R_3 and R_4 taken together are the residue of a 1,2-phenylene ring or a 1,2-cyclohexylene ring.

3,936,505

PROCESS FOR PREPARING UNSATURATED ALDEHYDE HAVING THREE TO FOUR CARBON ATOMS

Yoshio Oda; Keiichi Uchida, both of Yokohama; Manabu Suhara, Tokyo, and Takeshi Morimoto, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,727
Claims priority, application Japan, Feb. 22, 1972, 47-17653; Apr. 11, 1972, 47-35725; Apr. 17, 1972, 47-37800
Int. Cl.² C07C *45/02*
U.S. Cl. 260—604 R 4 Claims

1. A process for preparing an unsaturated aldehyde having three to four carbon atoms, which comprises:

reacting the corresponding olefin with molecular oxygen in a mole ratio of oxygen to olefin ranging from 3 : 1 to 1 :

5 in the vapor phase at a temperature of from 350°C to 520°C and a pressure of 1 to 10 atms. in the presence of a metal oxide catalyst having the formula:

$$Mo_{12}—X_a—Bi_b—Y'_c—O_d$$

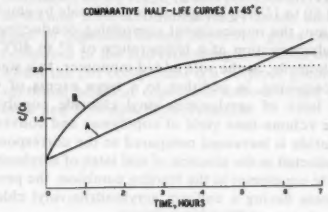
wherein X is Nb, or Ta; Y' is at least one metal, but not more than 2 metals selected from the group consisting of alkali metals, Cu, Te, As, Sb and Fe; *a* is 0.1 to 9; *b* is 1 to 12; *c* is 0.1 to 15; and *d* is 37 to 114.

3,936,506

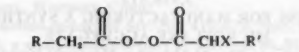
PREPARATION OF UNSYMMETRICAL HALOGEN-SUBSTITUTED DIACYL PEROXIDES

Robert V. Berthold, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 193,717, Oct. 29, 1971, abandoned. This application Feb. 26, 1973, Ser. No. 335,813
Int. Cl.² C07C *179/14*
U.S. Cl. 260—610 D **14 Claims**



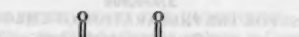
1. A method of preparing unsymmetrical α-halogen substituted diacyl peroxides having the formula:



wherein each of R and R' is a long chain alkyl radical having about 10 to about 16 carbon atoms and X is a halogen selected from the group consisting of bromine and chlorine, which comprises the steps of:

a. agitating an aqueous solution of an alkali metal peroxide at about 0° to about 10°C.;
b. adding a hydrocarbon solvent which is liquid at 0°C. to the agitated solution of (a) while maintaining a temperature of about 0° to about 10°C.;
c. rapidly adding about 1 mol of an α-halogen substituted aliphatic acyl halide having about 12 to about 18 carbons therein;
d. agitating the resultant mixture of (a), (b) and (c) for at least about 2 hours at about 0° to about 10°C.;
e. adding about 1 mol of an aliphatic acyl halide having about 12 to 18 carbon atoms therein in small regular increments to the agitated mixture of (d) and continuing agitation for at least 0.5 hours at a temperature of about 0° to about 10°C.;
f. lowering the pH of the agitated mixture of (e) to about 1 to 1.5 by acidification of said agitated mixture of (e);
g. allowing the resultant reaction mixture to stand unagitated until said reaction mixture separates into a hydrocarbon solution layer and an aqueous layer; and
h. isolating the hydrocarbon solution layer containing unsymmetrical halogen substituted diacyl peroxide.

8. A method of preparing unsymmetrical α-halogen substituted diacyl peroxides having the formula:



wherein each of R and R' is a long chain alkyl radical having about 10 to about 16 carbon atoms and X is a halogen selected from the group consisting of bromine and chlorine, which comprises the steps of:

A. agitating an aqueous solution of an alkali metal peroxide at about 0° to about 10°C.;
B. adding a hydrocarbon solvent which is liquild at 0°C. to the agitated solution of (A) while maintaining a temperature of about 0° to about 10°C.;
C. rapidly adding about 1 mol of an aliphatic acyl halide having about 12 to about 18 carbons therein;
D. agitating the resultant mixture of (A), (B), and (C) for at least about 2 hours at about 0° to about 10°C.;
E. adding about 1 mol of an α-halogen substituted aliphatic acyl halide having about 12 to 18 carbons therein in small regular increments to the agitated mixture of (D) while continuing agitation for at least about 0.5 hours at a temperature of about 0° to about 10°C.;
F. lowering the pH of the agitated mixture of (E) to about 1 to 1.5 by acidification of said agitated mixture of (E);
G. allowing the resultant reaction mixture to stand unagitated until said reaction mixture separates into an hydrocarbon solution layer and an aqueous layer; and
H. isolating the hydrocarbon solution layer containing unsymmetrical α-halogen substituted diacyl peroxide.

3,936,507

PROCESS FOR THE PRODUCTION OF 2,2-(4,4'-DIHYDROXY-DIPHENYL)PROPANE

Ferdinando Ligorati; Vittorio Emanuele Nova, and Giancarlo Aglietti, all of Milan, Italy, assignors to Società' Italiana Resine S.p.A., Milan, Italy

Filed Dec. 26, 1973, Ser. No. 428,576
Claims priority, application Italy, Dec. 22, 1972, 33446/72
Int. Cl.² C07C *37/00*, *37/20*, *37/38*
U.S. Cl. 260—619 A **7 Claims**

1. A process for the production of 2,2-(4,4'-dihydroxydiphenyl)propane, which comprises the steps of:

a. reacting phenol with acetone in a molar ratio of phenol to acetone of at least 2:1 and not exceeding 10:1 in the presence of an acid catalyst at a temperature not exceeding 80°C;
b. removing the acid catalyst and water from the resulting reaction mixture;
c. crystallizing and separating from said reaction mixture formed in (b) an addition product of 2,2-(4,4'-dihydroxydiphenyl)propane and phenol in a molar ratio of 1:1;
d. washing or recrystallizing the crystallized addition product using a solvent selected from the group consisting of paraffinic, aromatic and chlorinated hydrocarbons having a boiling point lower than about 150°C and employing weight ratios of solvent to addition product of from about 0.1:1 to 1:1 in the washing and from about 0.5:1 to 2:1 in the crystallization;
e. melting said separated addition product at a temperature between 90° to 120°C and then vaporizing said melted addition product by thin film evaporation at a temperature of from 180° to 250°C and at a pressure of from 1 to 20 mmHg for a time of from 0.1 to 30 minutes to obtain a gaseous mixture containing phenol and 2,2-(4,4'-dihydroxydiphenol)propane; and
f. subjecting said gaseous mixture to fractional condensation, thus separating and recovering said 2,2-(4,4'-dihydroxydiphenyl)propane at a temperature of from about 160° to 170°C and said phenol at a temperature of about 45°C.

3,936,508

PROCESS FOR THE PREPARATION OF CHLOROPRENE

Rupert Wenzel, and Gerhard Scharfe, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 27, 1974, Ser. No. 446,495

Claims priority, application Germany, Mar. 3, 1973, 2310744

Int. Cl.² C07C 17/34, 21/21

U.S. Cl. 260—655 5 Claims

1. A process for producing chloroprene which comprises dehydrating a mixture of an aqueous alkali metal hydroxide solution and n-butanol by azeotropic distillation, then reacting resulting dehydrated mixture with 3,4-dichlorobutene-1, removing insoluble alkali metal chloride from resulting reaction mixture and distilling resulting liquid reaction product to separate chloroprene and n-butanol.

3,936,509

PROCESS FOR SEPARATING DIMETHYL NAPHTHALENES COMPRISING 2,6-DIMETHYL NAPHTHALENES AS MAIN COMPONENT

Shizuo Nagahama; Keizo Shimada; Takeo Nishikawa, all of Hino, and Toshiaki Harada, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 4, 1974, Ser. No. 520,688

Int. Cl.² C07C 7/01

U.S. Cl. 260—674 N 2 Claims

1. A process for separating dimethyl naphthalenes having a component comprising 2,6-dimethyl naphthalene in the form of complexes with a complex-forming compound, which comprises contacting a dimethyl naphthalene isomer mixture comprising at least 2,6-dimethyl naphthalene or a hydrocarbon mixture containing said dimethyl naphthalene isomer mixture with a complex-forming compound selected from the group consisting of nitro compounds of 2,6-naphthalene dicarboxylic acid, trimellitic anhydride and 2-chloro-5-nitrobenzoic acid, thereby to form a mixture of complexes of the dimethyl naphthalenes with said complex-forming compound having a main component comprising a complex of 2,6-dimethyl naphthalene with the complex-forming compound, and separating the complexes in the solid state from the reaction mixture.

3,936,510

CURED AROMATIC RESINS

Glyn Islwyn Harris, Stourbridge, and Alfred Gerald Edwards, Stourport-on-Severn, both of England, assignors to Albright & Wilson Limited, West Midlands, England

Continuation of Ser. No. 282,614, Aug. 21, 1972, abandoned, which is a division of Ser. No. 9,946, Feb. 9, 1970, abandoned.

This application July 19, 1974, Ser. No. 490,025

Claims priority, application United Kingdom, Feb. 17, 1969, 8479/69

Int. Cl.² C08L 63/00, 63/02, 65/04

U.S. Cl. 260—831 39 Claims

1. A composition comprising the cured aromatic resin product consisting essentially of the product obtained by reacting at a temperature between 110° and 210°C

A. the reaction product obtained by reacting at a temperature between 130° and 200°C

1. a compound selected from the group consisting of aralkyl others of the general formula $R^1(-CH_2OR)_a$ and aralkyl halides of the general formula $R^1(-CH_2X)_a$ where R is an alkyl radical containing less than six carbon atoms, R^1 is a mono nuclear aromatic group, X is selected from the group consisting of chlorine, bromine and iodine, and *a* is 2 or 3, with

2. a phenol with 1 – 3 hydroxyl groups attached to the aromatic nucleus with at least two free nuclear hydrogen atoms per molecule, in a molar ratio of said phenol (2) to said ether or halide compound (1) being from 1.3 : 1 to 3 : 1, with

B. an epoxy compound containing at least two epoxy groups per molecule, the molar ratio of phenolic groups in the reaction product (A) to the epoxy groups of the epoxy compound (B) being from 1 : 2 to 2 : 1.

3,936,511

PROCESS FOR THE PRODUCTION OF ACRYLONITRILE-VINYL CHLORIDE COPOLYMERS

Joachim König, Schildgen, and Carlhans Süling, Odenthan-Hahnenberg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 11, 1974, Ser. No. 487,648

Claims priority, application Germany, Jan. 8, 1973, 2300713

Int. Cl.² C08L 33/20

U.S. Cl. 260—881 3 Claims

1. In the process for the production of acrylonitrile-vinyl chloride copolymers comprising 20 to 80% by weight of acrylonitrile and 80 to 15% by weight of vinyl chloride by emulsion polymerization; the improvement comprising conducting the emulsion polymerization at a temperature of 5° to 40°C. by adding acrylonitrile, as the sole added monomer, to a starting emulsion containing, in addition to a large excess of vinyl chloride, a latex of acrylonitrile-vinyl chloride copolymer, whereby the volume-time yield of copolymer and conversion of vinyl chloride is increased compared to the corresponding process conducted in the absence of said latex of acrylonitrile-vinyl chloride copolymer in the starting emulsion; the product of said process having a uniform acrylonitrile:vinyl chloride ratio and having good fiber properties.

3,936,512

PROCESS FOR MANUFACTURING A SYNTHETIC MICROFLAKE AGGREGATE

Yoshijiro Tabara; Hiroshi Akiyama; Masayuki Igawa; Tadashi Maekawa, and Tokuo Shinomiya, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Division of Ser. No. 864,457, Oct. 7, 1969. This application May 6, 1974, Ser. No. 467,592

Claims priority, application Japan, Oct. 14, 1968, 43-74209; Oct. 14, 1968, 43-74210; July 31, 1969, 44-60502; Aug. 2, 1969, 44-61322; Aug. 4, 1969, 44-61518

Int. Cl.² C08F 6/12

U.S. Cl. 260—897 A 17 Claims

1. A process for manufacturing a synthetic microflake aggregate useful for producing a paper-like synthetic sheet, comprising

a. preparing, in a closed container, a solution at a temperature not lower than 100°C, containing 5 to 40 weight percent of at least one polyolefin in an organic solvent capable of dissolving said polyolefin and having a boiling point not higher than said temperature of said solution at normal pressure, in the presence of 0.01 to 15%, based on the weight of said polyolefin, of at least one surface active compound,

b. spraying said polyolefin solution from said closed container through an orifice into an atmosphere maintained at a lower pressure than the pressure of said solution in said closed container, and

c. rapidly evaporating said organic solvent from said sprayed solution, whereby said solution is finely divided and converted to an aggregate of numerous irregular shaped micro-flakes.

3,936,513

GLOSS-STABILISED FIBRES AND FILMS OF ACRYLONITRILE COPOLYMERS

Günter Lorenz, Dormagen; Siegfried Korte, Leverkusen, and Carlhans Süling, Odenthal-Hahnenberg, all of Germany, assignors to Bayerwerk Aktiengesellschaft, Leverkusen, Germany

Filed June 19, 1973, Ser. No. 371,547

Claims priority, application Germany, June 19, 1972, 2229800

Int. Cl.² C08L 33/24

U.S. Cl. 260—898 12 Claims

1. A synthetic film, fiber or filament comprising a mixture of

a. from 80 to 96% by weight of a copolymer of acrylonitrile with from 20 to 80% by weight of vinylidene chloride, vinyl chloride, vinyl bromide or a mixture of these, and with from 0 to 5% by weight of a monomer with at least one functional acid group, a monomer with at least one functional basic group or a monomer with at least one functional acid and basic group; and

b. from 20 to 4% by weight of a polymer obtained by reacting a polyacrylic acid ester with dimethylamine under conditions which result in said polymer (b) containing 40 to 90 mol % of N,N-dimethylacrylamide units; said film, fiber or filament having improved gloss characteristics compared to the corresponding film, fiber or filament in which the (b) component is a polymer prepared by conventional addition copolymerization of the acrylic acid ester and N,N-dimethylacrylamide.

3,936,514

POLYALKYLENE GLYCOL VINYL PHOSPHATES

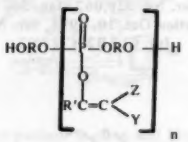
Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 410,674, Nov. 12, 1973, which is a continuation-in-part of Ser. No. 86,313, Nov. 2, 1970, Pat. No. 3,819,750, which is a continuation-in-part of Ser. No. 63,262, Aug. 6, 1970, abandoned. This application Sept. 6, 1974, Ser. No. 502,992. The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.

Int. Cl.² C07F 9/02

U.S. Cl. 260—929 8 Claims

1. Polyalkylene glycol vinyl phosphates having the formula:



wherein R is a polyalkylene glycol residue defined as that portion remaining after two hydroxyl groups have been removed from a polyalkylene glycol having the formula:

$$HO-R''-O\rfloor_m H$$

where R'' is an alkylene group of from 2 to about 20 carbon atoms, and m designates the number of repeating alkylene ether units and is from 2 to about 20, *n* is an integer from 1 to about 100, R' is selected from the group consisting of hydrogen, alkyl and haloalkyl having from 1 to 4 carbon atoms, Z and Y are each selected from the group consisting of halogen, hydrogen and alkyl, provided Z and Y are not both hydrogen ar alkyl.

3,936,515

SLINGER MEANS FOR HUMIDIFIER

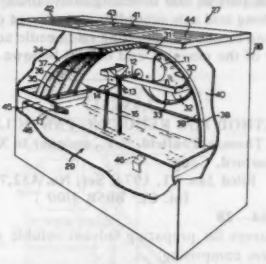
Juan Pablo Barreto, Barrie, Canada, assignor to General Electric Company, Bridgeport, Conn.

Filed Dec. 21, 1973, Ser. No. 427,147

Claims priority, application Canada, July 24, 1973, 177247

Int. Cl.² B01F 3/04

U.S. Cl. 261—29 8 Claims



1. A slinger device for use in a humidifer liquid dispersion system comprising a hub member mountable on a drive shaft in a plane normal thereto and for rotation therewith, and at least two divergent fin members connected to said hub member, said fin members symmetrically arranged around said hub member and each of the fin members including a base portion forming an angled extension of the surface of said hub member, said base portion inclined outwardly from said hub member relative to said drive shaft at an angle selected to cause liquid to flow outward along said base portion when said hub member is rotated by said drive shaft, each of the fin members further including flange means substantially coextensive with at least one side edge of said respective base portion, the outer edge of each flange means extending at a constant distance from the axis of rotation of said drive shaft.

3,936,516

CARBURETOR HAVING AN ALTITUDE-EFFECTS COMPENSATION MECHANISM AND A METHOD FOR THE MANUFACTURE OF SAME

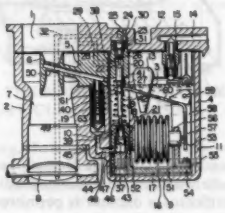
Toru Nakagawa, Mito, and Takashi Mihashi, Yokohama, both of Japan, assignors to Hitachi, Ltd. and Nissan Motor Co., Ltd., both of, Japan

Filed Nov. 23, 1973, Ser. No. 418,172

Claims priority, application Japan, Nov. 27, 1972, 47-118727

Int. Cl.² F02M 7/20

U.S. Cl. 261—39 A 7 Claims



1. An altitude effects compensated carburetor comprising an induction passage having a venturi therein and a throttle valve downstream of said venturi, a member defining said induction passage, a float chamber containing fuel therein, a metering body in said float chamber, said metering body having a substantially vertical part and a substantially horizontal part, an air jet provided in the upper portion of said vertical part, each end of which communicates with said induction

passage upstream of said venturi and downstream of said venturi respectively, a main fuel jet provided in the lower portion of said vertical part of said metering body, each end of which communicates with the fuel in said float chamber and said venturi respectively, a needle for controlling opening of each of said main fuel jet and said air jet, a bellows disposed within the fuel in said float chamber, the axis of which is substantially horizontal, one end of said bellows being fixed to said vertical part of said metering body, the other end being movable along said axis according to a change of atmospheric pressure, and means for operating said needle according to the movement of the movable end of said bellows.

3,936,517

METHOD FOR REDUCING PARTICLE SIZE

H. Ronald Thomas, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 11, 1974, Ser. No. 432,715
Int. Cl.² B05B 3/00
U.S. Cl. 264—28 10 Claims

1. A process for preparing solvent soluble solids in finely divided form comprising:
a. providing a solution of a solid material in solvent therefor;
b. freezing said solution;
c. comminuting said frozen solution;
d. mixing said comminuted frozen solution with a' liquid which is a non-solvent for said solid material under conditions of high shear agitation, said non-solvent being miscible with said solvent;
e. agitating said mixture such that said solvent melts and diffuses into said non-solvent and said solid precipitates out of solution in finely divided form;
f. recovering said solid in finely divided form, wherein the average particle size of said recovered solid in 20 microns or less.

3,936,518

PROCESS FOR PREPARING A SYNTHETIC WOOD

Shigenari Soda, Nagaokakyo, and Motoshige Hayashi, Ikoma, both of Japan, assignors to Sekisui Kaselhin Kogyo Kabushiki Kaisha, Nara, Japan

Filed June 18, 1974, Ser. No. 480,360
Claims priority, application Japan, June 20, 1973, 48-70176
Int. Cl.² B29D 7/22, 27/00
U.S. Cl. 264—45.5 6 Claims

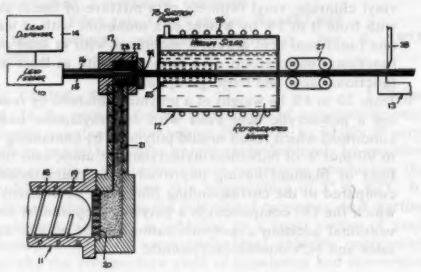
1. In a process for preparing a foamed thermoplastic article wherein a softened foamable thermoplastic resin is passed through an orifice of a die and is permitted to expand after passing through said orifice, the improvement comprising:
a. passing the softened thermoplastic resin through an orifice having a cross-section corresponding substantially to the cross-section of the desired article and having a plurality of recesses on the outer periphery thereof, said recesses extending toward the inlet side of said orifice,
(b) allowing the resin to expand to form a foamed shaped article having peaks and valleys on the surface thereof corresponding to the recesses of said orifice, and thereafter,
c. pressing the surface of said article while it is in a softened state so as to level the peaks and to provide a smooth-surfaced shaped article having surface structure characterized by high density portions corresponding to said peaks and low density portions corresponding to said valleys.

3,936,519

METHOD OF EXTRUDING FOAMED PLASTIC SHEATHED PENCILS

Milton Crystal, 1541 Lemoine Ave., Fort Lee, N.J. 07024

Filed Apr. 24, 1974, Ser. No. 463,813
Int. Cl.² B29D 27/00; B29F 3/10; B43K 19/14
U.S. Cl. 264—46.1 3 Claims



1. The method of fabricating pencils comprising the steps of:
A. advancing through the central tube of a coaxial die a graphite-clay lead pre-treated with a layer of heatactivatable adhesive, said die having an annular chamber surrounding said tube,
B. forcing into said annular chamber a molten plastic material containing a blowing agent, whereby the lead emerging from the die is coated with a cylindrical sheath of the molten foamed plastic material, the heat of which activates said adhesive,
C. passing the ensheathed lead through a cooling station to set said adhesive to effect a bond between the lead and the sheath and to rigidify said molten foamed plastic material to form a pencil rod.

3,936,520

PROCESS FOR MANUFACTURING PLASTIC SHUTTERS AND THE LIKE

Donald L. Garofalo, St. Paul, Minn., assignor to Andersen Corporation, Bayport, Minn.

Continuation of Ser. No. 328,067, Jan. 30, 1973, abandoned. This application Oct. 10, 1974, Ser. No. 513,575
Int. Cl.² B29C 17/02
U.S. Cl. 264—90 3 Claims

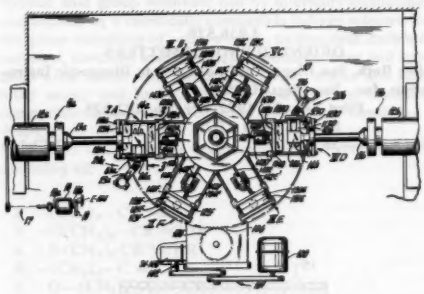
1. The process of manufacturing shutters and the like without substantial adhesive bonding which comprises the steps of:
a. forming a relatively thin rigid sheet of plastic material to thereby form a generally rectangular, panshaped shroud having a decorative front face and upturned sidewalls, said forming process creating a generally outwardly extending peripheral lip on said sidewalls;

b. removing at least a portion of the outwardly extending lip from the sidewalls;
c. positioning a frame within the shroud with the front face of the frame abutting the shroud and the outer rim of the frame lying adjacent the upturned sides of the shroud, said frame having a channel in its back face with an inclined bottom surface;
d. notching the four open corners of the shroud to thereby create a foldable marginal tab on each of the sidewalls;
e. heating the upturned sidewalls along a line generally parallel to the decorative front face of the plastic shroud;
f. post-forming the heated upturned sidewalls to embrace the outer rim of the frame without use of vacuum means, by the steps of:
i. applying mechanical force to the marginal tab to bend it along the heated line;
ii. positioning the mechanical force to bend the marginal tab 90° along the heated line and into the frame channel without generally causing the plastic shroud to permanently deform except along the heated line;
iii. applying mechanical force to the sidewall lip to bend the tab beyond 90° along the heated line and adjacent the channel bottom surface to at least partially prevent elastic restoring forces from displacing the tab out of the channel when cooled; and
g. cooling the plastic shroud in abutting engagement with the frame to provide a non-adhesive interlock between the frame and the marginal tab which resists deformation due to temperature variations.

3,936,521
METHOD FOR MULTIPLE BLOW MOLDING WITH ROTARY TURNTABLE

Donald M. Pollock, Morristown, and Fulton W. Hallowell, Rumson, both of N.J., assignors to Consupak, Inc., Morristown, N.J.

Division of Ser. No. 368,249, June 8, 1973, Pat. No. 3,854,855. This application July 18, 1974, Ser. No. 489,469
Int. Cl.² B29C 17/07
U.S. Cl. 264—98 **10 Claims**

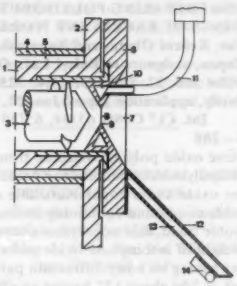


1. A method for parison loading and blow molding object unloading of a partible mold on a rotary indexing turntable comprising the steps of:
a. opening the mold containing said object as the mold is being indexed while continuously holding a flash portion of the object until the mold opens clear of the object;
b. forming a parison above the opened mold during said indexing;
c. releasing the flash portion and allowing the object to fall free of the opened mold;
d. positioning the parison between the open mold as the object falls past the mold; and
e. closing the mold on the parison and holding a flash portion of the parison prior to blowing and cooling.

3,936,522
PROCESS FOR THE PREPARATION OF INTERMEDIATES OF POLYADDITION AND POLYCONDENSATION RESINS

Peter Franz, Mumpf, Switzerland, assignor to Buss, A.G., Basel, Switzerland

Filed Aug. 20, 1973, Ser. No. 389,896
Claims priority, application Germany, Aug. 24, 1972, 2241616. The portion of the term of this patent subsequent to Feb. 22, 1989, has been disclaimed.
Int. Cl.² D01D 1/00
U.S. Cl. 264—141 **1 Claim**



1. A process for the preparation of fusible resinous intermediates of fully cross-linkable polyaddition and polycondensation resins, consisting essentially of:
continuously proportioning and feeding the resin precursor composition containing one of the precursors as a linear polymer, in solid or liquid form, in a mixing and kneading machine;
intensively mixing the resin precursor composition in both the longitudinal and transversal directions and simultaneously heating said composition, thereby plasticizing and homogenizing the same below the temperature of cross-linking and hardening and at a temperature of 50° to 90° C during a brief average dwell time in the mixing chamber of said machine which will prevent stiffening of the mixture whereby the mixture is in the form of a pasty mass at a temperature of about 50° to 90°;
continuously expelling the plasticized pasty mass at said temperature of 50° to 90° C through a hollow heated die having an outlet in the form of a twin conical throat with acute edges sloping away smoothly at inlet and outlet sides to a temperature of not more than 50° C;
preforming said expelled mass between a pair of rollers to form a strand;
cooling and solidifying the expelled strand into a friable state; and,
breaking up and grinding said strand into a powder adapted to fuse and cross-link.

3,936,523
METHOD FOR THE MANUFACTURE OF ELONGATED MATERIAL PARTICULARLY ELECTRIC CABLE AND WIRE

Wolfgang Kleeberg, Erlangen; Rudolf Wiedenmann, Nurnberg, and Helmut Ahne, Rottenbach, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. [illegible], 1974, Ser. No. 444,100
Claims priority, application Germany, Feb. 21, 1973, 2308637
Int. Cl.² B29C 25/00
U.S. Cl. 264—211 **48 Claims**

1. In a method for the manufacture of formed elongated articles of cross-linked polyethylene in which the polyethylene is shaped in the non-cross-linked condition and is subsequently cross-linked by the application of heat in the presence of organic radical-forming agents, the improvement wherein 0.1 to 20% by weight of polyethylene of a cross-link promot-

ing coagent selected from the group consisting of 2,4-dienoxy-6-amino-alkyl(ene)-s-triazines and N,N'-bis-(2,4-dienoxy-s-triazine-6)-diamines, is admixed with said polyethylene and is thereafter shaped and continuously cross-linked by application of heating at about atmospheric pressure and at a temperature above about 150°C. and below the decomposition temperature of the components of said mixture.

3,936,524

PROCESS FOR PREPARING POLYISOBUTYLENE OXIDE MOLDINGS OF EXCELLENT WORKABILITY

Hirotaka Toba; Keiichi Ohata, and Nagayoshi Tsukane, all of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Jan. 22, 1973, Ser. No. 325,924
Claims priority, application Japan, Jan. 27, 1972, 47-10119
Int. Cl.² C08G *65/04, 65/30*
U.S. Cl. 264—288 7 Claims

1. Isobutylene oxide polymer selected from the group consisting of homopolymers of isobutylene oxide and copolymers of isobutylene oxide and a copolymerizable cyclic ether or a copolymerizable compound containing an unsaturated carbon to carbon double bond, said copolymer containing at least 70 percent by weight of isobutylene oxide units said isobutylene oxide polymer having an x-ray diffraction pattern with a characteristic peak at $2\theta =$ about 12°, having an elongation at room temperature of from 200 to 400 percent and having a reduced specific viscosity of at least 1.0, said viscosity being determined by dissolving the isobutylene oxide polymer in o- dichlorobenzene in a concentration of 0.1 g/100 ml. and measuring the viscosity at 110°C.

3,936,525

REMOVAL OF SULFUR DIOXIDE FROM STACK GASES WITH PHOSPHATE SLIMES

Robert L. Lanning, Winter Haven, Fla., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1973, Ser. No. 402,644
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 6 Claims

1. Method of removing sulfur dioxide from gases containing at least 100 parts per million by volume sulfur dioxide comprising scrubbing said gases with an effective amount of phosphate slimes to absorb the sulfur dioxide therein to cause chemical reaction of said phosphate slimes with a substantial portion of said sulfur dioxide, which is removed from said waste gas, and exposing the phosphate slime containing the thus removed sulfur dioxide to air for a period of at least 3 days.

3,936,526

ALKYL ESTERS OF POLYENE ANTIBIOTICS

Tiberio Bruzzese, and Rodolfo Ferrari, both of Milan, Italy, assignors to SPA-Societa Prodotti Antibiotici S.p.A., Italy

Filed July 23, 1973, Ser. No. 381,563
Claims priority, application United Kingdom, July 24, 1972, 34497/72
Int. Cl.² A61K *35/00*
U.S. Cl. 424—119 5 Claims

1. A process for the preparation of an alkyl ester of Amphotericin B, wherein Amphotericin B is reacted with a diazoalkane containing from one to four carbon atoms in the presence of a basic substance selected from the group consisting of ammonia, triethylamine and pyridine in a substantially stoichiometric quantity, the resulting pH being 10 to 10.5 (determined after dilution to 1%), the reaction being carried out at a temperature between 15 and 30°C.

3,936,527

TREATMENT OF PETS

Conrad Hugh Alper, East Rockaway, N.Y., assignor to Damon Corporation, Needham Heights, Mass.

Continuation of Ser. No. 886,725, Dec. 19, 1969, abandoned.
This application Mar. 21, 1974, Ser. No. 453,211
Int. Cl.² A61K *37/00*
U.S. Cl. 424—177 7 Claims

1. A method of alleviating strong mouth odor in a dog or cat having said odor which comprises feeding said dog or cat an effective amount of methionine to reduce said odor.

3,936,528

ANALGESIC FORMULATIONS HAVING ENHANCED THERAPEUTIC ACTIVITY

Martin Katz, Palo Alto, Calif., assignor to Syntex Corporation, Palo Alto, Calif.

Filed Feb. 13, 1974, Ser. No. 442,004
Int. Cl.² A61K *31/19, 31/22, 31/235, 31/485*
U.S. Cl. 424—260 16 Claims

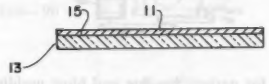
9. A method of treating a mammal to relieve pain which comprises administering to said mammal a therapeutically effective amount of an analgesic formulation comprising, as a first component, about 50 to about 750 mg. of d 2-(6-methoxy-2-naphthyl)propionic acid, or a pharmaceutically acceptable salt thereof, and, in combination therewith, as a second component, a central nervous system active analgesic compound selected from the group consisting of codeine, propoxyphene, or a pharmaceutically acceptable salt thereof; said components being present in the ratio of about 0.2 part by weight of said second component, expressed as propoxyphene hydrochloride, or about 0.02 to about 0.16 by weight of said second component, expressed as codeine sulfate, per part by weight of said first component, expressed as d 2-(6-methoxy-2-naphthyl)propionic acid; said formulation exhibiting enhanced analgesic activity over that which can be obtained utilizing either of said components alone.

3,936,529

ORIENTED PHOTOEMITTERS

Walter Roth, San Diego, Calif., assignor to Diagnostic Instruments, Inc., San Diego, Calif.

Filed Aug. 21, 1972, Ser. No. 282,028
Int. Cl. H05b *33/28;* B44d *1/44*
U.S. Cl. 427—36 7 Claims



1. A method of forming an improved ionographic photoemitter comprising: selecting a substrate of mica; depositing on the substrate a layer of a photoemissive material consisting of lead, the photoemissive material being deposited in a preferred crystallographic orientation providing relatively high photoemissivity; subjecting the photoemissive material to x-ray exposure, causing a decrease in the photoemissive yield thereof; and annealing the photoemissive material on the substrate to partially restore and stabilize the photoemissive yield thereof.

3,936,530
METHOD FOR PREPARING COATINGS USING CURABLE SOLID STYRENE-ALLYL ALCOHOL COPOLYMER BASED POLYENE AND POLYTHIOL COMPOSITIONS

Charles R. Morgan, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

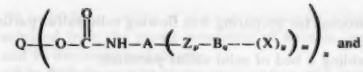
Division of Ser. No. 250,729, May 5, 1972, Pat. No. 3,832,421. This application Dec. 18, 1973, Ser. No. 425,748
Int. Cl.[2] B05D 3/06
U.S. Cl. 427—43 20 Claims

1. A process which comprises:

A. applying to the surface of a substrate a solid layer of a curable composition consisting essentially of

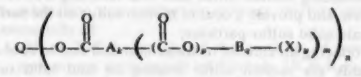
1. a solid polyene containing at least 2 reactive unsaturated carbon to carbon bonds per molecule selected from the group consisting of polyene compounds having the general formula:

(I)



and

(II)

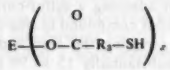


wherein Q is a styrene-allyl alcohol copolymeric moiety remaining after n hydroxyl groups of a styrene-allyl alcohol copolymer have reacted to form (i) n urethane linkages in Formula I and (ii) n ester linkages in Formula II; A and B are polyvalent organic radical members free of reactive carbon to carbon unsaturation and are independently selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl containing 1 to 36 carbon atoms and mixtures thereof, said group members can be internally connected to one another by a chemically compatible linkage selected from the group consisting of —O—, —S—, carboxylate, carbonate, carbonyl, urethane and substituted urethane, urea and substituted urea, amide and substituted amide, amine and substituted amine and hydrocarbon; Z is a divalent chemically compatible linkage selected from the group consisting of -NH-C-O-,
—O— and —S—; X is a member selected from the group consisting of:

a. $-(CH_2)_d-CR'=CHR$
b. $-O(CH_2)_d-CR'=CHR$
c. $-S-(CH_2)_d-CR'=CHR$
d. $-(CH_2)_d-C\equiv CR$
e. $-O-(CH_2)_d-C\equiv CR$
f. $-S-(CH_2)_d-C\equiv CR$

and mixtures thereof; where R and R′ each are independently selected from the group consisting of hydrogen and methyl radicals; *d*, *k*, *p* and *q* are each integers from 0 to 1; *y* is an integer from 1 to 10; *m* and *n* are each integers of at least 1; with the proviso that when *n* is 1, *y* or *m* is at least 2; and

2. a solid polythiol containing at least 2 thiol groups per molecule of the general formula:



wherein *x* is an integer of at least 2; E is a styrene-allyl alcohol copolymeric moiety remaining after removal of *x* hydroxyl groups from a styrene-allyl alcohol copolymer to form *x* ester linkages; and R_3 is a polyvalent organic radical member free of reactive carbon to carbon unsaturation and is selected from the group consisting of aryl, substituted aryl, aralkyl, substituted aralkyl, cycloalkyl, substituted cycloalkyl, alkyl and substituted alkyl groups containing 1 to 16 carbon atoms and mixtures thereof, the total combined functionality of (1) the reactive unsaturated carbon to carbon bonds per molecular in the polyene and (2) the thiol groups per molecule in the polythiol being greater than 4;

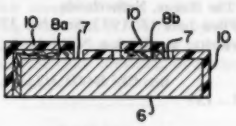
B. exposing selected areas of said composition to a free radical generator, thereby curing the exposed areas of said composition; and

C. removing the unexposed uncured areas of the curable composition, thereby baring the surface of said substrate beneath the removed uncured areas of the composition.

3,936,531
MASKING PROCESS WITH THERMAL DESTRUCTION OF EDGES OF MASK

Peter H. Hofer, Berkeley Heights, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 1, 1973, Ser. No. 356,214
Int. Cl. B49d 1/52
U.S. Cl. 427—49 27 Claims



1. A process for masking a defined area on a substrate which is to be coated with a combustible coating material which suffers a loss at a temperature of > 25°C., of at least about 125 percent in the elongation value of such combustible material as measured at 25°C., which comprises

providing heating element means along the edges of said defined area,

placing combustible masking means over said defined area and said heating element means,

applying the combustible coating material to the substrate so as to coat the unmasked area of said substrate and at least those portions of the combustible masking means which cover said heating element means,

heating said heating element means to a temperature and for a period of time as is sufficient to decompose said masking means and said coating material along the edges of said defined area, and

removing the remaining masking means and said heating element means from said substrate.

3,936,532
ACTIVATION OF THIN WIRE EMITTERS FOR FIELD IONIZATION/FIELD DESORPTION MASS SPECTROMETRY

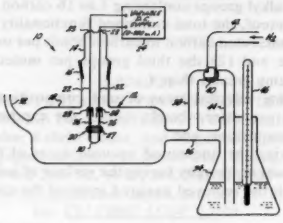
Douglas F. Barofsky, Portland, Oreg., assignor to Oregon Graduate Center for Study and Research, Beaverton, Oreg.

Filed Feb. 8, 1974, Ser. No. 440,826
Int. Cl.[2] B05D 5/12
U.S. Cl. 427—111 10 Claims

1. In the manufacture of an activated wire field anode for field ionization and field desorption mass spectrometry by a

method including the activation of a tungsten wire, the improvement comprising the preactivation steps of

providing a substantially uniform granular oxide surface layer on the wire, and



reducing the oxide layer to the parent metal, yielding a substantially uniformly roughened surface.

3,936,533

METHOD FOR APPLYING CONTRAST COLOURED MARKING LINES TO THE SURFACE OF ROADS

Jan de Jong, Roermond, Netherlands, assignor to Fabran Holding B.V., The Hague, Netherlands

Filed June 15, 1973, Ser. No. 370,553

Claims priority, application Netherlands, June 16, 1973, 7208316

Int. Cl.² B44D 3/22

U.S. Cl. 427—137 9 Claims

1. A method for continuously forming and applying contrast colored marking lines including raised periodic projecting crossrib structures on the surface of a road, said method including the steps of:

providing a storage trough containing a contrast colored viscous marking material,

passing said storage trough over said road surface along a path over which it is desired to apply said marking line,

providing a controllable slit-shaped opening along the lower trailing edge of said storage trough with the opening dimensions being controlled by an upwardly and downwardly movable back wall member, said slit-shaped opening being carried above and substantially parallel to the said road surface and discharging said marking material therefrom,

repetively moving said back wall member upwardly with a fast impulse motion such that an upper limit position is attained within a time shorter than one-half of the time period between such upwardly directed impulse movements, and

repetively moving said back wall member downwardly to a lower limit position after each of said upwardly directed movements thereby continuously forming and applying marking lines having a basic thickness corresponding to said lower limit position, a raised crossrib projection thickness corresponding to said upper limit position, and a relatively steeply inclined reflecting face on each such crossrib corresponding to the upwardly directed fast impulse motion of said back wall member.

3,936,534

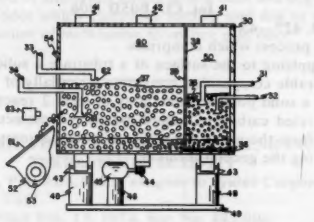
PROCESS FOR PRODUCING FREE FLOWING PARTICULATE SULFUR

Alvin H. Schallis, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed June 18, 1973, Ser. No. 371,006

Int. Cl.² B05D 7/00, 3/12

U.S. Cl. 427—215 13 Claims



1. A process for preparing free flowing solid sulfur particles comprising:

a. tumbling a bed of solid sulfur particles;

b. introducing molten sulfur into said tumbling bed to distribute and provide a coat of molten sulfur on the surface of said solid sulfur particles;

c. introducing an amount of water into said bed to cool and solidify the molten sulfur coating on said solid sulfur particles to thereby form free flowing coated sulfur particles;

d. removing said free flowing substantially dust free coated sulfur particles from said bed.

3,936,535

METHOD OF PRODUCING FIBER-REINFORCED COMPOSITE MEMBERS

Horst Böder, Westendorf uber Donauworth, Germany, assignor to Sigri Elektrographit GmbH, Meitingen b. Augsburg, Germany

Filed Feb. 7, 1973, Ser. No. 330,186

Claims priority, application Germany, Feb. 12, 1972, 2206700

Int. Cl.² B05D 3/02

U.S. Cl. 427—228 6 Claims

1. Method of producing heat-resistant, fiber-reinforced composite members which comprises coating fibers formed of a substance selected from the group consisting of carbon and graphite first with a substance selected from the group consisting of a dilute solution of hardenable resin and an emulsion of hardenable resin dispersed in a liquid, drying the coated fibers so as to remove, respectively, the solvent or the liquid therefrom, laying out the fibers in layers, curing the layers at 120° to 180° C whereby said fibers are surrounded by a firmly adhering layer of said resin, then impregnating the fiber layers with tar pitch and heating the tar pitch-impregnated fiber layers to a temperature above 800°C to carbonize the tar pitch and the resin.

3,936,536

METHOD OF MAKING RUBBER-COATED WIRE

Marlyn J. Brock, deceased, late of Akron, Ohio, by Betty R. Brock, executrix, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 13, 1974, Ser. No. 442,257

Int. Cl.² B05D 3/02, 1/38

U.S. Cl. 427—229 1 Claim

1. The method of adhering a sulfur-curable carbon black containing diene rubber compound to zinc-coated steel, which method comprises covering the zinc surface with a diene rubber containing substantially 15 to 90 parts by weight of

carbon black and 0.1 to 5 parts by weight of $CoCl_2 . 2NH_3$ which contains 2 molecules of water, per 100 parts by weight of the rubber, curing the rubber and heating for a sufficient time for ammonia to be given off and for action of the ammine complex to form a strong bond with the zinc.

3,936,537

DETERGENT-COMPATIBLE FABRIC SOFTENING AND ANTISTATIC COMPOSITIONS

Ralph James Baskerville, Jr., and Francis Gennaro Schiro, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 1, 1974, Ser. No. 520,187
Int. Cl.² B05D *3/12*; **D06M** *13/46*
U.S. Cl. 427—242 **36 Claims**

13. A detergent composition adapted to prevent static buildup on textiles laundered therewith consisting essentially of:

1. 50 to 90% by weight of the composition of a surfactant selected from the group consisting of anionic, nonionic, and zwitterionic surfactants,
2. 10 to 50% by weight of the composition of a particulate combination comprising an intimate mixture consisting essentially of:
   A. 80 to 20% by weight of the particles of quaternary ammonium compounds of formula $[R_1R_2R_3R_4N]^+Y^-$, wherein at least one of $R_1R_2R_3$ and R_4 is an organic radical containing a group selected from a C_{16}–C_{22} aliphatic radical, or an alkyl phenyl or alkyl benzyl radical having 10 to 16 carbon atoms in the alkyl chain, the remaining group or groups being selected from C_1–C_4 alkyl, C_2–C_4 hydroxyalkyl, and cyclic structures in which the nitrogen atom forms part of the ring, Y constituting an anionic radical selected from the group consisting of halide and methosulfate ions,
   B. 20 to 80% by weight of the particles of a dispersion inhibitor, being a solid organic material having a solubility in water of 50 ppm max at 25°C and a softening point in the range 100°F to 200°F, said material being selected from the group consisting of paraffinic waxes, cyclic and acyclic mono- and polyhydric alcohols, substituted and unsubstituted aliphatic carboxylic acids, esters of the foregoing alcohols and acids, C_3–C_4 alkylene oxide condensates of any of the foregoing materials and mixtures thereof,

substantially all of the individual particles having a size within the range 10μ to 500μ, said product having a solubility in water of 50 ppm max at 25°C and having a softening point in the range 100° to 200°F

3,936,538

POLYMERIC FILM DRYER-ADDED FABRIC SOFTENING COMPOSITIONS

Susan Kathryn Marshall, Pittsburgh, Pa.; Thomas Graham Gerding, Rumson, N.J., and Elmer Miller King, Coraopolis, Pa., assignors to Calgon Consumer Products Company Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 452,224, March 18, 1974, abandoned. This application Sept. 25, 1974, Ser. No. 508,931
Int. Cl.² B05D *3/12*; **D06M** *15/00, 15/08*
U.S. Cl. 427—242 **16 Claims**

1. A fabric-softening composition consisting essentially of an essentially uniform, self-supporting preformed film comprising at least one film-forming polymer having a molecular weight of at least 100,000, a fabric softener and a waxy surfactant.

3,936,539

HIGH TEMPERATURE RESISTANT DIFFUSION COATING

Alfonso L. Baldi, Drexel Hill, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 254,403, May 18, 1972, Pat. No. 3,785,854, which is a continuation-in-part of Ser. No. 90,682, Nov. 18, 1970, Pat. No. 3,764,371. This application Nov. 6, 1972, Ser. No. 304,220
Int. Cl. C23c *13/02*
U.S. Cl. 427—253 **8 Claims**

1. The process of pack aluminizing method workpieces at temperatures of about 1000°F or below using an aluminum halide enerigizer selected from the group consisting of aluminum chloride, aluminum bromide, aluminum iodide or hydrated derivatives thereof, wherein the energizer is held in at least one porous container placed in the pack.

3,936,540

HOT DIP GALVANISING

Ian James, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed June 12, 1974, Ser. No. 478,830
Claims priority, application United Kingdom, July 12, 1973, 33313/73
Int. Cl.² C23C *1/00*
U.S. Cl. 427—310 **7 Claims**

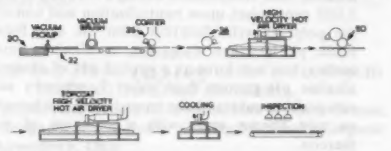
1. In the method of hot dip galvanising a ferrous metal article which comprises passing the article into molten zinc through a molten flux disposed on the surface of the zinc, and subsequently removing the article from the molten zinc, the improvement which comprises using a flux melting below 500°C and consisting essentially of 30 – 70% by weight magnesium chloride and 20 – 70% by weight of at least one compound selected from the class consisting of sodium chloride, potassium chloride and mixtures thereof.

3,936,541

SURFACE DECORATION OF EMBOSSED OR TEXTURED PANEL PRODUCTS

Larry M. Plowman, Royal Oak, and Thomas G. Lahaye, Holland, both of Mich., assignors to Abitibi Corporation, Troy, Mich.

Filed Dec. 26, 1973, Ser. No. 427,708
Int. Cl.² B05D *5/00*
U.S. Cl. 427—262 **8 Claims**



1. A method of producing a distinctive pattern on a panel comprising passing a panel in a path of travel, the panel having a multi-level surface pattern of pronounced ridges and walled recesses or valleys, applying a liquid coating of coloring material over said surface, and thereafter removing at least some of said liquid material from at least the higher ones of the ridges and portions of the walls of the recesses or valleys by transferring the liquid material onto a non-absorbent resiliently deformable surface of a rotating roll, said transferring of the liquid material including effecting pressurized contact between the resiliently deformable roll surface and the moving panel surface with the surface speed and direction of rotation of the roll being so related to the speed and direction respectively of the panel surface as to avoid substantial relative motion at the regions of contact therebetween whereby to avoid substantial displacement of the liquid material into said recesses or valleys, continually removing from the roll surface

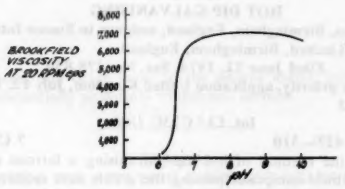
the liquid material which has been transferred thereto from the panel surface so that the roll continually presents a substantially clear surface to the coated panel surface, and thereafter, effecting drying or curing of the liquid material remaining on the panel.

3,936,542

METHODS OF CONTROLLING MIGRATION OF SYNTHETIC RESINS APPLIED TO POROUS MATERIALS

Andrew John Cox, Usk, United Kingdom, assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 15, 1973, Ser. No. 416,342
Int. Cl.² B05D 5/00
U.S. Cl. 427—288 11 Claims



1. A method of print bonding nonwoven fibrous webs in an intermittent print pattern with a stable resin binder composition and controlling the binder migration thereon which comprises:

treating nonwoven fibrous webs with an alkaline material to raise the pH above about 7 to give same an alkaline reserve potential; and

applying the stable resin binder composition to said fibrous webs with a binder applying print roll, said resin binder composition having a viscosity of less than 1000 centipoises and comprising a synthetic resin and low viscosity, self-thickening resin having a polycarboxylate capability of converting said acidic resin composition to a neutral or alkaline resin composition having a viscosity of more than 3,000 centipoises upon neutralization and conversion of the polycarboxylic function from the acid form at an acidic pH less than about 7 to an alkali or ammonium carboxylate salt form at a neutral pH of about 7 or an alkaline pH greater than about 7, whereby said resin composition substantially immediately thickens in place on said fibrous webs with a minimum of migration thereon.

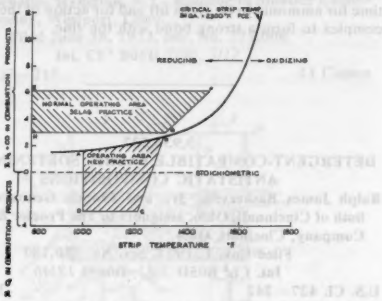
3,936,543

METHOD OF COATING CARBON STEEL

Fred Byrd, Lebanon; Marvin B. Pierson, Franklin; Thomas A. Compton, Middletown, and Frank C. Dunbar, Monroe, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 22, 1974, Ser. No. 499,772
Int. Cl.² C23C 1/00
U.S. Cl. 427—320 11 Claims

1. A method of preparing carbon steel strip and sheet for fluxless hot dip metallic coating, comprising the steps of heating said strip and sheet in a furnace heated by direct combustion of fuel and air therein and in an atmosphere containing from about 3% by volume oxygen to about 2% by volume excess combustibles in the form of hydrogen and carbon monoxide, controlling the strip and sheet temperature within the range of about 540° to about 705° C, and thereafter heating said strip and sheet in a subsequent furnace containing at


CRITICAL STRIP TEMP. IN GA. = 2300°F RCE
REDUCING
OXIDIZING
NORMAL OPERATING AREA SILAS PRACTICE
A OPERATING AREA NEW PRACTICE
STOICHIOMETRIC
% H₂ + CO IN COMBUSTION PRODUCTS
% O₂ IN COMBUSTION PRODUCTS
STRIP TEMPERATURE °F

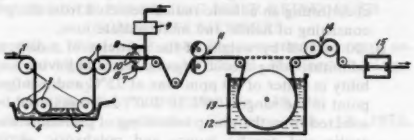
least about 5% hydrogen by volume and balance substantially nitrogen to a temperature of at least about 675°C.

3,936,544

PROCESS FOR THE MANUFACTURE OF FLAT-SHAPED ARTICLES

Helmut Kriebitz, Viersen; Theodor Ploetz, Hoesl, and Popko Julius Westerhuis, Hueckelhoven-Baal, all of Germany, assignors to Feldmuehle Aktiengesellschaft, Dusseldorf-Oberkassel, Germany

Filed May 10, 1974, Ser. No. 469,041
Claims priority, application Germany, May 10, 1973, 2323583
Int. Cl.² B05D 3/04, 3/10
U.S. Cl. 427—335 12 Claims



1. A method of producing binder-treated flat-shaped fibrous articles, such as paper, woven fabric, knitted fabric and nonwoven fabric, by a process which includes a step of uniformly treating the articles with a desired amount of an aqueous dispersion of a polymeric binder including a sensitizing agent for causing said dispersion to coagulate at a temperature substantially below 100°C., heating the articles to coagulate the binder and thereafter drying the articles, the heating step being characterized by directing at least one jet of steam at a pressure higher than atmospheric pressure, said pressure being at least about 7.5 p.s.i.g., against at least one major surface of each of the articles to suddenly coagulate the binder without evaporation of the aqueous vehicle in the dispersion.

3,936,545

METHOD OF SELECTIVELY FORMING OXIDIZED AREAS

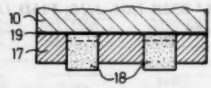
Klaus Brill, Korntal, and Christian Glassman, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 31, 1972, Ser. No. 302,629
Claims priority, application Germany, Dec. 3, 1971, 2160008
Int. Cl.² C23C 11/00, 13/00
U.S. Cl. 427—343 16 Claims

1. A method of producing a visibly patterned metal layer supported on a carrier which comprises the steps of:

vapor-depositing a layer of a first metal under vacuum on said carrier substrate,

vapor-depositing under vacuum, at selected locations on said carrier, a second metal having corrosion inciting properties with respect to the first metal, such as to promote the formation of corrosion products of said first metal at said locations, and then



exposing the metal layer on said carrier to an oxidizing atmosphere to produce at said selected locations modified portions of the metal layer remaining fixed on said carrier and having characteristics readily distinguishable optically from unaffected portions of said metal layer,

the two aforesaid metal layer deposition steps being performed successively in the order above set forth under continued maintenance of vacuum.

3,936,546

PROLONGING THE STABILITY OF COATING BATHS

Wilbur S. Hall, Plymouth Meeting, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 152,994, June 14, 1971, abandoned. This application May 31, 1973, Ser. No. 365,699

Int. Cl.[2] B05D *1/18*; B04D *3/10*

U.S. Cl. 427—375 26 Claims

1. In the method wherein an organic resinous coating is applied to a metallic surface by immersing said surface in an acidic aqueous coating composition containing an oxidizing agent and dispersed solid particles of an organic coating-forming resin dispersed in said composition by a dispersing agent associated therewith, said dispersing agent and resin being present in a predetermined proportion, and wherein metal ions are formed by the dissolution of said metallic surface through the chemical action of said coating composition, and wherein said metal ions are oxidized to a form which renders said dispersed resin unstable in the region of said surface and wherein said unstabilized resin deposits and forms on said surface a resinous coating, the thickness or amount of which increases during at least a portion of the time said surface is immersed in said composition, and wherein said resinous coated surface is withdrawn from said composition and is heated to fuse the resin, and wherein additional metallic surfaces are immersed in said composition and are coated as set forth, and wherein ingredients of said composition are consumed as said surfaces are coated, and wherein additional amounts of said ingredients are added to said composition to replenish the concentrations thereof, and wherein as said metallic surfaces are coated as set forth, there is formed in said composition additional excess oxidized metal ions which tend to cause said dispersed resin to become unstable, not only in the region of said metallic surface, but also throughout the other portions of said coating compositions, as characterized by flocculation, coagulation or gelation of the dispersed resin particles, thereby rendering said composition inoperative for coating, the improvement comprising adding dispersing agent and resin to said composition in amounts to replenish these ingredients and in a proportion such that the proportion of said added dispersing agent to said added resin is greater than said predetermined proportion and sufficient to maintain the stability of said dispersed resin in said other portions of said composition thereby prolonging the operability of said coating composition.

3,936,547

PROCESS OF PREPARING MELAMINE RESIN FILMS BY IMPREGNATION OF PAPER, CELLULOSE, FLEECE OR FABRIC

Karl Schnee, Dornigheim; Dieter Tichy, Frankfurt am Main; Walter Michel, Frankfurt am Main, and Günter Gruber, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Feb. 14, 1974, Ser. No. 442,644

Claims priority, application Germany, Feb. 24, 1973, 2309334

Int. Cl.[2] B05D *3/02*; C08L *61/20*

U.S. Cl. 427—390 8 Claims

1. A process for preparing a melamine resin film which comprises impregnating paper, cellulose fleece or fabric with a solution of monomeric dimethylolmelamine monomethylether, dimethylolmelamine dimethylether, trimethylolmelamine monomethylether, trimethylolmelamine dimethylether, or trimethylolmelamine trimethylether or a mixtue thereof and drying the same at temperatures of about 90° to about 200°C., preferably of 130° to 180°C.

3,936,548

METHOD FOR THE PRODUCTION OF MATERIAL FOR PRINTED CIRCUITS AND MATERIAL FOR PRINTED CIRCUITS

Jiri K. Konicek, Perstorp, Sweden, assignor to Perstorp AB, Perstorp, Sweden

Continuation-in-part of Ser. No. 283,955, Aug. 28, 1972. This application Feb. 27, 1974, Ser. No. 446,334

Claims priority, application Sweden, Feb. 28, 1973, 7302829; Feb. 28, 1973, 7302830

Int. Cl.[2] B44D *1/34*; C23F *1/34*, *1/44*

U.S. Cl. 427—405 9 Claims

1. A method for the production of a material for use in the production of printed circuits comprising applying a thin layer of zinc to a foil of aluminum or an aluminum alloy galvanically replacing the layer of zinc wholly or partly, by a layer of a metal selected from the group consisting of nickel, iron, chrome, tin, cadmium and cobalt and plating a layer of copper to the metal layer.

3,936,549

METHOD AND APPARATUS FOR APPLYING A LIQUID COATING TO STRIP MATERIAL

John B. Kohler, and Ronald R. Brookes, both of North Canton, Ohio, assignors to The Kohler Coating Machinery Corporation, Greentown, Ohio

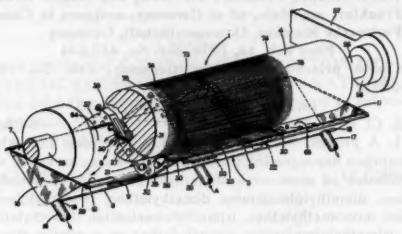
Filed Nov. 17, 1972, Ser. No. 307,385

Int. Cl. C23c *1/02*; B05c *1/08*

U.S. Cl. 427—428 12 Claims

1. The method of applying a coating liquid to a surface of a moving object including the steps of providing an elongated coating liquid container having spaced weirs each formed with an upper curved portion; continually supplying coating liquid to said liquid container in excess so that a body of coating liquid is maintained in the container between the weirs; moving an object to be coated in a direction normal to the elongated container through the liquid body therein in a curved path with the object extending laterally of the liquid body in each direction beyond the weirs; providing a spacing between the curved weir portions and the object being coated; flowing coating liquid outwardly beyond the weirs laterally of the object being coated through the controlled spacings; controlling the spacing between the object being coated and the curved weir portions to prevent contact between the weir

portions and the moving object being coated, and to control the flow of liquid between the moving object and the curved weir portions; providing coating liquid eollecting compartments outside of the weirs; collecting coating liquid flowing



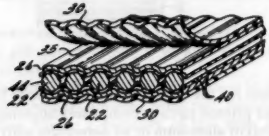
through the controlled spacings beyond the curved weir portions and the moving object in said collection compartments; and maintaining the liquid level in the collecting compartments below the lowest level of the curved weir portions.

3,936,550

COMPOSITE METALLIC PREFORM TAPE

Robert G. Carlson, and Carl A. Steinhagen, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 133,207, April 12, 1971, Pat. No. 3,719,538. This application Dec. 4, 1972, Ser. No. 311,813
Int. Cl. B32b *3/00*
U.S. Cl. 428—294 2 Claims



1. A composite metallic tape comprising;
a single layer of a plurality of aligned, substantially spaced apart, high strength, high modulus filaments held between a pair of metallic foils through a thin, non-metallic adhesive bonding material which will decompose leaving substantially no residue upon heating at a temperature below that at which the foil and filament will melt,
each foil being plastically deformed around at least a portion of substantially each filament in an amount sufficient to hold the aligned filaments therebetween in the substantially spaced apart relationship.

3,936,551

FLEXIBLE WOOD FLOOR COVERING

Armin Elmendorf, 56 Granada Court, Portola Valley, Calif. 94303, and Roland Etzold, 487A Thompson Ave., Mountain View, Calif. 94043

Filed Jan. 30, 1974, Ser. No. 438,087
Int. Cl.² B32B *3/10*
U.S. Cl. 428—50 9 Claims

1. The method of making a flexible wood floor covering which comprises the steps of producing wood blocks from 1/16-inch to 3/16-inch thick, assembling the blocks in edge-to-edge relationship, covering the assembled blocks with a plastic resin film with an adhesive between the film and the blocks, placing an elastic cushion on the film, subjecting the assembly to heat adequate to soften the film, then cooling the assembly under pressure to cause the adhesive to bond the film to the blocks.

3,936,552

NONMETALLIC COMPOSITE FRICTION MEMBER

Carroll P. Krupp, Akron, and Hildreth W. Stevenson, Medina, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 5, 1975, Ser. No. 547,245
Int. Cl.² B32B *1/04, 3/10;* F16D *13/60, 69/00*
U.S. Cl. 428—64 10 Claims

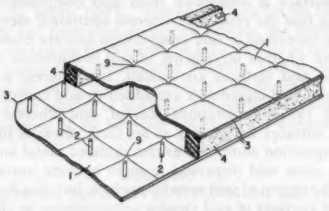
1. In a disc brake which includes a rotor and a stator wherein at least one of said rotor or stator is a nonmetallic composite friction member, said friction member comprising:
a. a first disc shaped carbon component having two radially extending faces and consisting essentially of bulk graphite; and
b. a second carbon component comprising at least one ply of carbon cloth impregnated with a carbonized resin, wherein the second carbon component is bonded to a face of the first carbon component.

3,936,553

INSULATING MATERIALS

Alexander W. Rowe, Johannesburg, South Africa, assignor to Rorand (Proprietary) Limited, South Africa

Filed Nov. 23, 1973, Ser. No. 418,202
Claims priority, application South Africa, Nov. 24, 1972, 72/8342
Int. Cl.² B32B *3/12, 5/18, 27/38;* E04B *2/28*
U.S. Cl. 428—81 9 Claims



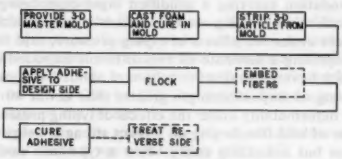
1. Insulation material comprising a pair of generally parallel surface sheets of fluid impervious material sealed together through thermally insulating material at their free edges and held in spaced relation by a series of transverse pins spaced apart over the area of the surface sheets, the space between the surface sheets being evacuated and provided with a plastic film having a metallic coating.

3,936,554

THREE DIMENSIONAL DECORATIVE MATERIAL AND PROCESS FOR PRODUCING SAME

William H. Squier, Taylors, S.C., assignor to M. Lowenstein & Sons, Inc., New York, N.Y.

Division of Ser. No. 272,340, July 17, 1972. This application Apr. 19, 1974, Ser. No. 462,210
Int. Cl.² B32B 3/30
U.S. Cl. 428—88 6 Claims



1. A three dimensional stock material comprising:

a. an organic polymeric foam base, said base having been foamed in situ over a pattern having a three dimensional surface, whereby said base has an exposed in situ molded three dimensional surface design conforming to said pattern surface;

b. an organic polymeric adhesive layer on said exposed three dimensional surface design; and

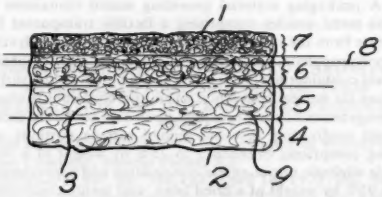
c. short synthetic polymeric textile fibers secured in said adhesive layer, said fibers being positioned in said layer to simulate the surface characteristics of said pattern.

3,936,555

FILLED TEXTILE FABRIC WITH A DENSITY GRADIENT

Alexander M. Smith, II, Elkin, N.C., assignor to The Fiberwoven Corporation, Elkin, N.C.

Continuation-in-part of Ser. No. 221,614, Jan. 28, 1972, Pat. No. 3,817,820. This application Oct. 17, 1973, Ser. No. 407,169. The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.
Int. Cl.² B32B 5/06, 5/22
U.S. Cl. 428—151 40 Claims



1. A filled textile fabric characterized by high bulk density, a network of entangled fibers and a positioned axis of flexure; comprising textile fibers needled together into an integral needled structure having coherent fiber entanglement and an overall bulk density of at least 10 pounds per cubic foot; and a filler within the needled structure preferantially disposed toward the face surface thereof in an amount insufficient to fill all of the intersticies between the fibers of the structure; said filled fabric having an overall bulk density of between 20 and 60 pounds per cubic foot, a bulk density gradient wherein the bulk density increases from the back surface of the fabric to the face surface thereof and an axis of flexure which lies within about 0.4 of the distance from the face to the back surface.

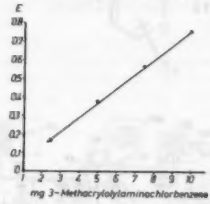
24. A method for producing a filled textile fabric comprising needling textile fibers together into an integral structure with a face surface and back surface so that the overall bulk density of the needled structure is at least 10 pounds per cubic foot and the bulk density increases from the back surface to the face surface and produces an axis of flexure within 0.4 of the distance from the face surface to the back surface; applying a liquid phase filler to the needled structure in an amount insufficient to fill the voids of the needled structure, lagging the structure for a time sufficient to allow the liquid to move by capillary action to preferentially dispose the liquid phase filler toward the face surface, coagulating the filler from the liquid phase into particulate form which is at most loosely bonded to the fibers of the structure, and removing the liquid phase from the structure, whereby the fabric produced has an overall bulk density of between 20 and 60 pounds per cubic foot and the said bulk density gradient and position of the axis of flexure of the needled structure is at least preserved.

3,936,556

MARKING OF ARTICLES

Carlhans Süling, Odenthal-Hahnenberg; Hans Theidel; Hellmut Striegler, both of Leverkusen, and Wolfram von Langenthal, Pulheim, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 13, 1974, Ser. No. 442,177
Claims priority, application Germany, Feb. 16, 1973, 2307592
Int. Cl.² B41M 3/14
U.S. Cl. 428—195 9 Claims



1. A process for marking a manufactured article with identification which comprises applying a marking agent to said manufactured article, said marking agent being a high molecular weight compound containing at least one group which can be removed by a cleaving reaction to form a low molecular weight compound, said low molecular weight compound being a diazotizable amine or an amine or phenol which can be coupled with a diazonium salt and thus converted into a dye.

3,936,557

EPOXIDE BLEND FOR POLYMERIZABLE COATING COMPOSITIONS AND PROCESS

William Russell Watt, Princeton Junction, N.J., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 144,668, May 18, 1971, Pat. No. 3,794,576. This application Apr. 9, 1973, Ser. No. 349,487
Int. Cl.² B50D 3/06
U.S. Cl. 428—211 33 Claims

1. The process of producing an epoxide polymer, comprising:

forming an essentially solventless mixture, fluid at room temperature, consisting essentially of

1. at least one epoxidic prepolymer material having an epoxy equivalent weight below 200, constituting between about 10% and 85% of the weight of the epoxidic materials in the mixture, and selected from the group consisting of

A. an epoxy resin prepolymer consisting predominantly of the monomeric diglycidyl ether of bisphenol A,

B. a polyepoxidized phenol novolak or cresol novolak,

C. a polyglycidyl ether of a polyhydric alcohol, and
D. a diepoxide of a cycloalkyl or alkylcycloalkyl hydrocarbon or ether,

2. an epoxidic ester having two epoxycycloalkyl groups and constituting at least about 15% of the weight of the epoxidic materials in the mixture, and
3. radiation-sensitive catalyst precursor which decomposes upon exposure to electron beam or electromagnetic irradiation to provide a Lewis acid effective to initiate polymerization of said epoxidic materials in said mixture;

applying a portion of the mixture so formed to a substrate

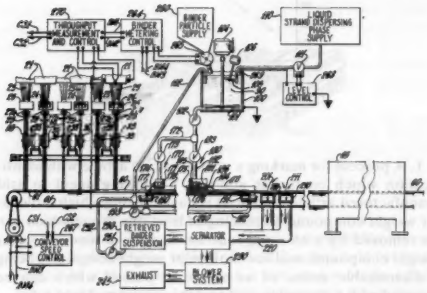
and subsequently exposing said mixture on the substrate to electron beam or electromagnetic irradiation to effect substantial polymerization of said epoxidic materials.

3,936,558

FIBROUS BODIES AND METHOD AND APPARATUS FOR PRODUCING SAME

Gerhard N. Bolen; Sidney C. Dunbar, both of Granville, and George E. Smock, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 233,549, March 10, 1972, abandoned. This application May 3, 1974, Ser. No. 466,764
Int. Cl.² B32B 7/02
U.S. Cl. 428—212 7 Claims



1. A nonwoven mat having strands of continuous glass filaments generally disposed in irregularly shaped looping formation comprising at least two layers of the strands of continuous filaments, a portion of the strands of one of the layers being filamentized such that the filaments of those strands are separated from each other and binder material in each of the layers such that the one layer having strands that are filamentized contains more binder material than the other layer, the binder material in each layer being uniformly distributed in that layer.

2. A nonwoven fibrous mat having strands of continuous filaments generally disposed in irregularly shaped looping formation comprising:

a. two contiguous layers of the strands of continuous filaments, one layer having the filaments of that layer more dispersed than the filaments in the other layer; and
b. binder material joining the filaments into an integral mat where one layer contains more binder material than the other layer.

3,936,559

PRESSURE-SENSITIVE TRANSFER ELEMENTS

Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Division of Ser. No. 117,162, Feb. 19, 1971, abandoned. This application Mar. 5, 1973, Ser. No. 337,926
Int. Cl.² B32B 7/02
U.S. Cl. 428—212 6 Claims

1. A pressure-sensitive transfer element comprising a plastic film foundation carrying a solidified layer comprising pressure-transferable imaging material which is transferable to a copy sheet under the effects of typing pressure, said foundation comprising a laminate of two different extruded plastic films, each having a maximum caliper of about 1 mil, one said film having an impact strength greater than about 40 kg/cm and low deformability under the effects of typing pressure and the other of said film having an impact strength below about 20 kg/cm but deforming easily about a type face under the effects of typing pressure, said films being bonded together by means of a thin adhesive intermediate layer to form a laminate having greater deformability under the effects of typing pressure than the said one film and greater impact strength than the said other film and having greater dimensional stability under the effects of changes in temperature and humidity than either of said films per se.

4. A pressure-sensitive transfer element according to claim 1 in which the foundation comprises a laminate of polyethylene terephthalate polyester as the one film and a polyolefin as the other film.

3,936,560

SELF-SEALABLE CORROSION PROTECTABLE PACKAGING MATERIAL AND METHOD OF MAKING

Pasco R. Santurri, Ballwin; Howard W. Mumm, St. Louis County, and Thomas E. Yockey, Florissant, all of Mo., assignors to The Orchard Corporation of America, St. Louis, Mo.

Filed Feb. 22, 1974, Ser. No. 444,906
Int. Cl.² C23F 15/00
U.S. Cl. 428—219 15 Claims

1. A packaging material providing sealed containers for ferrous metal articles comprising a flexible transparent film substrate from the class consisting of polybutylene, polyethylene, polypropylene, polystyrene, and polyethylene terephthalate, said container having first and second confronting surface portions for mutual adherence when said container is closed, a homogeneous coating provided upon said substrate including said confronting first and second surface portions, said coating comprising between 5 to 25% by weight of a water soluble aliphatic nitrite-amide composition and approximately 75 to 95% by weight of a dried latex, said amide composition being from the class consisting of propionamide, allyl urea, acetamide, propyl carbamate, butyramide, dimethyl urea, guanidine, stearamide, and N-butyl urea.

3,936,561

ANTI-DUSTING TREATMENT OF TEXTILES

James F. Cotton, West Point, Ga., assignor to West Point-Pepperell, Inc., West Point, Ga.

Filed Apr. 2, 1974, Ser. No. 457,347
Int. Cl.² B32B 7/00, 23/00
U.S. Cl. 428—264 1 Claim

1. In a durable press cellulosic fabric which has been treated with a durable press cross-linking textile resin and thereafter cured, the improvement in which the tendency of the treated fabric to form dust has been reduced by applying to the fabric a dust-inhibiting amount of polyethylene glycol whose molecular weight is at least about 100,000.

3,936,562

FIRE RETARDANT FABRICS

Marshall W. Duke, and Razmic S. Gregorian, both of Aiken, S.C., assignors to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 222,681, Feb. 1, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 434,783
Int. Cl.² C09K *3/28*; C09D *5/18*
U.S. Cl. 428—277 12 Claims

1. A process for rendering a cellulose containing fabric fire retardant comprising:

a. impregnating the fibers of the cellulose-based fabric with an aqueous aminoplast resin composition, such that the fibers become wet and swollen, in an amount sufficient to produce a resin content in the final fabric in the range from about 2% to 25% by weight based on the total weight of the fabric;

b. polymerizing the resin in the impregnated fabric while the fibers are in a wet and swollen state;

c. adjusting the pH of the fabric to a value greater than about 7.0;

d. impregnating the fabric with a solution of tetrakis (hydroxymethyl) phosphonium hydroxide in an amount sufficient to produce a phosphorus content in the final fabric in the range from about 1% to 3% by weight based on the total weight of the fabric;

e. subjecting the impregnated fabric to curing conditions consisting essentially of heating the fabric at a temperature in the range from about 300°F to 400°F for a time period from about 2 to 20 minutes; and

f. washing and drying the fabric.

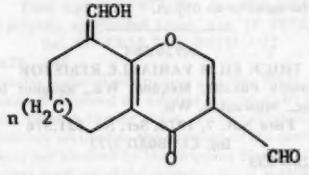
3,936,563

HYDROXYMETHYLENE-SUBSTITUTED CHROMONE-3-ARBOXALDEHYDES, PROCESS FOR THEIR PREPARATION AND INTERMEDIATES PRODUCED THEREBY

Daniel Kaminsky, Parsippany, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 352,134, April 18, 1973, Pat. No. 3,879,426. This application Dec. 20, 1974, Ser. No. 534,599
Int. Cl.² A61K *31/35*
U.S. Cl. 424—283 1 Claim

1. A method for preventing asthmatic symptoms which comprises administering to a mammal in need thereof from 5 to 50 mg/kg of body weight of a compound having the formula:



wherein *n* represents 1 or 2.

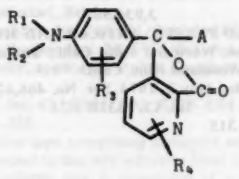
3,936,564

PRESSURE-SENSITIVE COPYING PAPER CONTAINING LACTONE COMPOUNDS OF PYRIDINE-CARBOXYLIC ACID

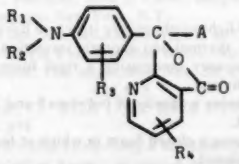
Yoshihide Miyazawa; Minoru Ozutsumi; Satoshi Ogawa, all of Tokyo; Keiso Saeki, and Akio Watanabe, both of Fuojimiya, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo and Fuji Photo Film Co., Ltd., Minami-ashigara, both of, Japan

Filed July 24, 1974, Ser. No. 491,193
Claims priority, application Japan, July 24, 1973, 48-82648
Int. Cl.² B41M *5/16*
U.S. Cl. 428—307 2 Claims

1. A pressure-sensitive copying paper coated with a microencapsulated using as a color former a lactone compound of a pyridine-carboxylic acid represented by the formula



or (I)



or a mixture thereof, wherein R_1 and R_2 each represents a hydrogen atom, an acyl group, a lower alkyl group which may

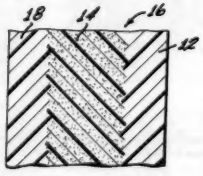
be substituted with a halogen atom, a cyano, hydroxyl, lower alkoxy, lower alkylamino, acetyl or phenoxy group, or a benzyl or phenyl group which may be substituted with a lower alkyl group, a halogen atom, a lower alkoxy, nitro, amino or lower alkylamino group, or R_1 and R_2 may, when taken together with a nitrogen atom to which R_1 and R_2 are attached, form a part of a saturated hydrocarbon chain of a heterocyclic ring; R_3 represents a hydrogen or halogen atom, a nitro, amino, lower alkylamino group or a lower alkyl group which may be substituted with a halogen atom or a lower alkoxy group, a lower alkoxy group which may be substituted with a halogen atom, or a benzyl, benzyloxy or phenoxy group which may be substituted with a halogen atom, a lower alkyl, alkoxy or lower alkylamino group; R_4represents a hydrogen or halogen atom, a lower alkyl group or a phenyl group; and A represents a carbazolyl, acridinyl, phenothiazinyl, thienyl, thianaphthenyl, morpholinophenyl, julolidinyl or tetrahydroquinolyl group which may be substituted with a lower alkyl, lower alkylamino, acyl or nitro group; the alkyl moiety in said lower alkyl, lower alkoxy or lower alkylamino group containing 1 to 5 carbon atoms.

3,936,565

MOLDED PLASTIC ARTICLE AND METHOD

Elmer H. Good, Woodland Hills, Calif., assignor to Hollowform, Inc., Woodland Hills, Calif.

Filed May 3, 1974, Ser. No. 466,622
Int. Cl.² B32B *3/26*
U.S. Cl. 428—315 **7 Claims**



1. A foamed lightweight plastic structure having the properties of rigidity, thermal and acoustic insulation, impact resistance and buoyancy comprising a rigid foam core of high density polyethylene,
   said foam having a density of between 8 and 20 pounds per cubic foot,
   said foam being a closed foam in which at least 90% of the cells are closed,
   said polyethylene having a density of at least 0.960,
   said foam core having affixed thereto at least one skin member,
   said skin member being a cross-linked polyethylene having a density in the cured condition of at least 0.94,
   said skin member being affixed to said core by a bond characterized by the absence of applied adhesive and being the adherent joint formed by curing said cross-linked polyethylene in contact with said foam core, and
   the flexural strength of said foam core and affixed skin being greater than the flexural strengths of said foam core and said skin member.

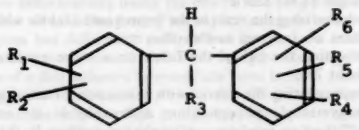
3,936,566

PRESSURE SENSITIVE RECORD MATERIAL EMPLOYING DIARYL ALKANE SOLVENTS

Atsushi Sato, Yokohama; Yoshiaki Aida, and Isoo Shimizu, both of Kawasaki, all of Japan, assignors to Nippon Petrochemicals Company Ltd., Tokyo, Japan

Division of Ser. No. 229,195, Feb. 24, 1972, abandoned. This application Oct. 19, 1973, Ser. No. 407,986
Claims priority, application Japan, Mar. 2, 1971, 46-10542; Mar. 15, 1971, 46-13965
Int. Cl.² B41M *5/02*
U.S. Cl. 428—323 **1 Claim**

1. A pressure sensitive record material which comprises a paper sheet coated with microcapsules holding internally a liquid containing a dye-precursor and at least one compound represented by the general formula:



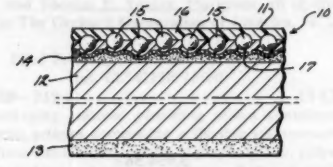
in which R_1 and R_2 are hydrogen; R_3 is methyl; R_4 and R_5 are hydrogen, methyl or ethyl; R_6 is an alkyl group selected from methyl, ethyl, n-propyl, isopropyl, sec-butyl and tert-butyl, and the total carbon atom number of R_4, R_5 and R_6 is 1–4.

3,936,567

LIGHT-REFLECTIVE ADHESIVE LABEL

Edward U. Vesely, Glendale, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Mar. 25, 1974, Ser. No. 454,588
Int. Cl.² B32B *3/16*
U.S. Cl. 428—325 **2 Claims**



1. A composite light-reflective adhesive label construction comprising, in combination:
   1. a first film having
      a. an outer layer of light reflective film consisting of small sphere lenses embedded in a transparent binder and a light reflective coating behind the sphere lenses to provide reflex reflection of incident light; and
      b. a pressure sensitive adhesive layer;
   2. a second plastic film adhered to the pressure sensitive adhesive of the first film to form a supporting layer for the first film, the first and second films being joined together prior to manufacture of the label; and
   3. a layer of adhesive applied to the second film on a surface thereof opposite from the first film and which is used to affix the label to an object.

3,936,568

THICK FILM VARIABLE RESISTOR

Clifford Joseph Pukaite, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Nov. 7, 1974, Ser. No. 521,576
Int. Cl.² B05D *5/12*
U.S. Cl. 428—333 **7 Claims**

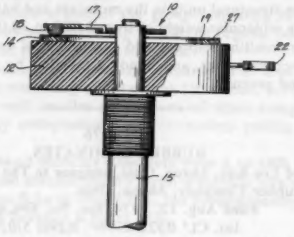
1. A thick film resistor for use in a variable resistor or potentiometer comprising:
   an insulating substrate

a thick film resistor layer attached to said substrate, said resistor layer comprising an amorphous ceramic material containing a predetermined amount of conductive material and having an exposed contact surface, said contact surface being etched with acid, and

a thin layer of a conductive metal selected from the group consisting of gold, silver or platinum deposited on said etched surface.

4. A method of making a thick film resistor for use in a potentiometer or variable resistor comprising the steps of:

forming a fluid mixture of a thick film resistive material and an organic vehicle;



applying a film of said mixture to a non-conductive ceramic substrate;

firing said mixture and said substrate at an elevated temperature to remove said organic vehicle;

etching the exposed surface of said resistor film with acid; and

applying a thin layer of a conductive metal selected from the group consisting of gold, silver or platinum to said etched surface.

3,936,569

METALS COATED WITH 3,3,3-TRIFLUORO-2-TRIFLUOROMETHYL PROPENE/VINYLIDENE FLUORIDE COPOLYMER COMPOSITIONS

William A. Miller, Somerville, and Brian W. Robinson, Chester, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 12, 1973, Ser. No. 424,031

Int. Cl.² B32B *15/08, 27/30*

U.S. Cl. 428—339 **9 Claims**

1. A coated article comprising a metal substrate having an overlying layer coated directly thereon comprising a copolymer of 3,3,3-trifluoro-2-trifluoromethyl propene and vinylidene fluoride and an effective amount of a stabilizing agent to prevent surface microcracks in said overlying layer, said stabilizing agent being selected from the group consisting of the oxides and salts of divalent metals and mixtures thereof and said overlying layer having a thickness of at least about one mil.

3,936,570

TRANSFER MATERIAL

Torayoshi Iwata, Kyoto, Japan, assignor to Nissha Printing Co., Ltd., Kyoto, Japan

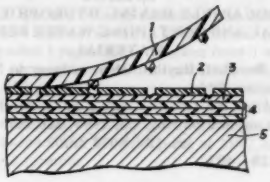
Filed Apr. 12, 1974, Ser. No. 460,448

Claims priority, application Japan, Apr. 19, 1973, 48-46293

Int. Cl.² C09J *7/02;* **B41M** *3/12*

U.S. Cl. 428—349 **4 Claims**

1. A transfer material comprising a carrier sheet, a stripping layer releasably disposed on discrete spaced-apart portions of the surface of said carrier sheet, a color-containing design layer adhesively secured to the portions of the surface of said carrier sheet not covered by the stripping layer and extending over adjacent portions of the stripping layer, said design layer being sufficiently adhesively secured to the carrier sheet to provide tearing of the design layer when the carrier sheet is removed from the stripping layer whereby depressions having matted surfaces are formed in the stripping layer by the torn portions of the design layer, and a laminate assembly adhesively secured to the design layer and to any portion of the



stripping layer not covered by the design layer, the laminate assembly including an outermost layer of heat-sensitive adhesive adapted to be secured to a receiving article.

3,936,571

ADHESIVE TAPE

Albert Emiel Van Hoof, Berchem, and Georges Arthur Holvoet, Mortsel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 260,201, June 6, 1972, abandoned. This application June 24, 1974, Ser. No. 482,562

Claims priority, application United Kingdom, June 7, 1971, 19182/71

Int. Cl.² C09J *7/02;* **B32B** *9/04*

U.S. Cl. 428—355 **9 Claims**

1. An adhesive tape comprising a support and an adhesive layer characterized in that said adhesive layer is water-soluble and/or alkali-soluble and is composed of a homogeneous mixture of at least one water-soluble and/or alkali-soluble polymer and a tackifier consisting of a carboxylated monoether of a polyglycol which corresponds to the general formula:

$$R - X - O - A - COOH$$

wherein:

R represents an alkyl-substituted phenyl group, the alkyl group of which contains 8 or 9 carbon atoms, or a saturated or mono-unsaturated aliphatic hydrocarbon of 12 to 18 carbon atoms,

A represents methylene or ethylene, and

X stands for 7 to 30 recurring oxyethylene groups, which may be interrupted by one or more oxypropylene groups.

3,936,572

ELECTRIC CABLE INSULATED WITH A CORONA RESISTANT POLYETHYLENE COMPOSITION CONTAINING A SILICON ADDITIVE

Burton Thornley MacKenzie, Jr., Monroe, and Charles Frank Wallace, Jr., Fairfield, both of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 246,153, April 21, 1972, Pat. No. 3,795,646, which is a continuation of Ser. No. 794, Jan. 5, 1970, abandoned. This application Nov. 30, 1973, Ser. No. 420,515

Int. Cl.² B32B *15/08;* **H01B** *17/62*

U.S. Cl. 428—379 **13 Claims**

4. An electric cable comprising a metallic conductor and a thermoset insulation having improved resistance to corona surrounding said conductor, said thermoset insulation consisting of the cured product of:

a. a polymeric member containing not less than about 50by weight of ethylene selected from the group consisting of polyethylene, blends of polyethylene and other polymers, and copolymers of ethylene and other polymerizable materials selected from the group consisting of propylene and vinyl acetate;

b. a peroxide curing agent for effecting cross-linking of said polymeric member; and

c. a silicone fluid having a viscosity not greater than about 100 centistokes at 25°C present in the range of from

about 2 to 5 parts by weight per 100 parts by weight of polymeric material.

3,936,573

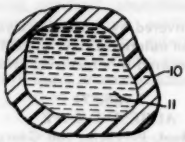
MICROCAPSULE HAVING HYDROPHILIC WALL MATERIAL AND CONTAINING WATER SOLUBLE CORE MATERIAL

Bruce W. Brockett, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Division of Ser. No. 159,312, July 2, 1971, Pat. No. 3,861,941. This application Aug. 23, 1974, Ser. No. 499,820

Int. Cl.² B01J *13/02*

U.S. Cl. 428—402 **7 Claims**



1. A pressure-rupturable liquid-droplet-containing microcapsule comprising hydrophilic, water-swellable, organic, polymericfilm wall material and core material comprising a water-immiscible oil which is capable of dissolving about one to ten percent by weight of water, said oil being further characterized by having dissolved therein water and a water-soluble color-forming reactant material all mutually dissolved to yield a core material of a single phase solution.

3,936,574

OXIDATION RESISTANT CARBONACEOUS BODIES AND METHOD OF PRODUCING SAME

Glenn R. Marin, Niagara Falls, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,264

Int. Cl. B44d *1/02;* **C23c** *17/06*

U.S. Cl. 428—408 **2 Claims**

1. A method for making a carbonaceous article comprising reinforced and laminated carbon oxidation resistant by forming a coating thereon, comprising the steps of:

a. coating the surface of the article with a thin uniform layer of a suspension comprising about 10 to about 35% of elemental boron having an average particle diameter in the range of about 0.5 to about 2 microns, said elemental boron being dispersed in a thermosetting resin solution, said solution comprising about 40 to about 60% furfuryl alcohol prepolymer, about 40 to about 60% furfural and about 1 to 10% maleic anhydride; and

b. heating the coated article in the temperature range of about 300° to about 400°F under an inert atmosphere, thereby curing the coated suspension for forming the oxidation resistant coating on the article.

3,936,575

FLEXIBLE METAL-CLAD LAMINATES AND METHOD FOR MANUFACTURING THE SAME

Tsutomu Watanabe; Takahiro Nakayama, and Sigenori Yamaoka, all of Yokohama, Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Filed Feb. 19, 1974, Ser. No. 443,621

Claims priority, application Japan, Feb. 21, 1973, 48-20246; June 20, 1973, 48-68800

Int. Cl.² E05D *3/48, 3/96, 15/00*

U.S. Cl. 428—417 **28 Claims**

1. A method for manufacturing a metalclad laminate for flexible printed circuits, which comprises impregnating an electrically insulating fibrous base material with a resin composition comprising a mixture of 100 parts by weight of at least one polyepoxy compound having at least two epoxy groups in the molecule and 10 to 300 parts by weight of at least one copolymer selected from the group consisting of copolymers (A) of aromatic vinyl compounds with maleic anhydride, said copolymers containing at least 30 mole percent of maleic anhydride structural units in the molecule, alkyl partial esters (B) of said copolymers (A), copolymers (C) of aromatic vinyl compounds with alkyl maleates, said copolymers containing at least 30 mole percent of mono-alkyl maleate structural units in the molecule, and copolymers (D) of aromatic vinyl compounds with maleic anhydride and alkyl maleates, said copolymers containing at least 30 mole percent, in total, of maleic anhydride structural units and monoalkyl maleate structural units in the molecule and having a number average molecular weight of from 2,000 to 30,000, then placing the resulting impregnated base material and a metal foil one over the other, and bonding together by application of heat and pressure.

3,936,576

RUBBER LAMINATES

Edward Leo Kay, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 12, 1974, Ser. No. 496,420

Int. Cl.² B32B *27/40;* **B29H** *5/02*

U.S. Cl. 428—424 **8 Claims**

1. A lamination of two rubber substrates adhered by the cured adhesive composition of an organic isocyanate and an adhesion promoter of the class consisting of 2-chlorocyclohexanone oxime, mono or di-nitrosylchloride adduct of dicyclopentadiene in the oxime form and a substantially 16.5-weight per cent nitrosyl chloride adduct of polybutadiene in the oxime form.

3,936,577

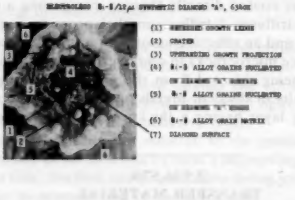
METHOD FOR CONCOMITANT PARTICULATE DIAMOND DEPOSITION IN ELECTROLESS PLATING, AND THE PRODUCT THEREOF

Theodore Peter Christini, Kennett Square, Pa.; Albert Lawrence Eustice, and Arthur Hughes Graham, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 208,233, Dec. 15, 1971, abandoned. This application Mar. 15, 1973, Ser. No. 341,529

Int. Cl.² B32B *15/00;* **B05D** *3/10*

U.S. Cl. 428—426 **6 Claims**


ELECTROLESS Ni-P/SiC μ SYNTHETIC DIAMOND "A", 650X
(1) RETARDED GROWTH LEDGE
(2) CRATER
(3) UPSTANDING GROWTH PROJECTION
(4) Ni-P ALLOY GRAINS ENCLOSING OR REARING "A" SURFACE
(5) Ni-P ALLOY GRAINS ENCLOSING OR REARING "A" EDGES
(6) Ni-P ALLOY GRAIN MATRIX
(7) DIAMOND SURFACE

1. A coated article formed by electroless plating comprising a co-deposited uniform dispersion of diamond particles secured by substantial nucleation within a metallic matrix comprising one of the group consisting of: (1) an alloy including a metal of the sub-group made up of nickel, cobalt and mixtures thereof with one of the elements phosphorus, boron and mixtures thereof and (2) elemental copper, deposited on a supporting substrate consisting of polymer, metal, ceramic or glass.

2. A method of forming a composite structure on an article by electroless plating comprising immersing said article in a stable electroless plating bath having a composition effecting concurrent deposition of particulate diamond dispersed in a metallic matrix comprising one of the group consisting of: (1)

an alloy including a metal of the sub-group made up of nickel, cobalt and mixtures thereof with one of the elements phosphorus, boron and mixtures thereof and (2) elemental copper, while maintaining agitation of said bath retaining said particulate diamond in suspension, and removing said article carrying said composite structure from said bath when said composite structure has been plated out on said article in preselected amount.

3. A coated article formed by electroless plating consisting of a shaped substrate, a metallic matrix coating deposited on said shaped substrate, and a uniform dispersion of co-deposited diamond particles secured by nucleation bonding within said metallic matrix, wherein

1. said substrate is one of the group consisting of (a) an organic polymer, including reinforced organic polymers, (b) metals, (c) ceramics, (d) glass,
2. said metallic matrix consists primarily of at least one of the group consisting of (a) nickel, (b) cobalt, (c) copper, together with smaller proportions of other components commonly codeposited from electroless plating baths, and
3. said diamond particles constitute from 1 to 50% by volume of said metallic matrix, with a particle size ranging from about 0.1μ to about 75μ, but predominantly in the size range between 0.5μ to 25μ.

3,936,578

METHOD OF RENDERING A SUBSTRATE NON-STICK TOWARDS TACKY SUBSTANCES BY COATING THE SUBSTRATE WITH AN ORGANOSILICON COMPOSITION

Jean Dumoulin, and Louis Linguenheld, both of Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 350,760, April 13, 1973, Pat. No. 3,821,154. This application Dec. 7, 1973, Ser. No. 423,377

Claims priority, application France, Apr. 14, 1972, 72.13250

Int. Cl.² B32B *15/08, 17/10, 27/06, 27/28*

U.S. Cl. 428—429 **13 Claims**

1. A method of rendering a substrate non-stick towards tacky substances which comprises applying to the substrate an organosilicon composition comprising by weight:

a. 100 parts of an α-ω-dihydroxydimethylpolysiloxane polymer, with a viscosity of at least 25,000 centipoise at 25°C, containing at most 0.1% by weight of hydroxyl groups,

b. 3 to 250 parts of a dimethylpolysiloxane rubber terminated at each end of its chain by a unit of the formula $(CH_3)_3SiO_{0.5}$ or $(CH_3)_2CH_2{=}CHSiO_{0.5}$, with a viscosity of at least 1 million centipoise at 25°C,

c. 10 to 50 parts of a crosslinking agent of the general formula $(Q)_{4-n}Si[(OCH_2CH_2)_pOQ']_n$ in which the symbol Q represents a hydrolyzable radical selected from the group consisting of N,N-dialkylaminoxy, ketoniminoxy and aldiminoxy radicals, the symbol Q′ represents a methyl or ethyl radical, the symbol n represents a number from 1 to 4 and the symbol p represents 1 or 2,

d. 1 to 10 parts of a catalyst selected from the group consisting of organic derivatives of tin, chelates of titanium, chelates of iron, metal salts of aliphatic carboxylic acids and polymers possessing $\equiv$Ti-O-Sn$\equiv$ chains,

e. 0 to 10 parts of a vulcanisation accelerator of the general formulae $YSi(OCOY)_3$ and

$$(Y)_{1-}SiO_{\frac{4-1-1'}{2}}$$
$$(YCOO)_{1'}$$

in which each symbol Y independently represents an alkyl radical of 1 to 4 carbon atoms, a vinyl radical or a phenyl radical, the symbol 1 represents a number from 1 to 1.98 and the symbol 1′ represents a number from 0.08 to 2,

f. 500 to 5,000 parts of an organic solvent, and

g. 5 to 30 parts of a hydroxylic methylpolysiloxane oil containing at least 3% by weight of hydroxyl groups, of viscosity between 3 and 400 centipoise at 25°C, of the average general formula:

$$(CH_3)_{a-}SiO_{\frac{4-a-b}{2}}$$
$$(HO)_{b}$$

in which the symbol a represents a number from 1.7 to 2.3 and the symbol b represents a number from 0.14 to 1.

13. A method according to claim 1, wherein the substrate is a sheet or film of paper, cardboard, parchment, cellulosic material, polyamide, polyester, metal, glass or asbestos.

3,936,579

ABSORBENT FILM PRODUCED BY VACUUM EVAPORATION

Yoshiaki Ogasawara, Yokohama, and Katsumi Noguchi, Gamagohri, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 117,288, Feb. 22, 1971, abandoned. This application Feb. 22, 1973, Ser. No. 334,572

Claims priority, application Japan, Feb. 25, 1970, 45-15505

Int. Cl.² B32B *17/06;* **G02B** *1/10, 5/22*

U.S. Cl. 428—432 **2 Claims**

1. In an absorbent film deposited on a substrate having a refractive index of about 1.52 by evaporating a mixture of plural materials within a vacuum; the improvement wherein the mixture comprises Cr, Ti and MgF_2 and the ratio in weight of said Cr, Ti and MgF_2 is 1.0 : 0.02 to 0.2 : 0.10 to 1.5 such that the absorbent film has the same refractive index as the substrate and an absorption coefficient of from about 0.01 to about 0.4.

3,936,580

ELECTRICALLY CONDUCTIVE GLASSLIKE FILMS ON GLASS OR CERAMIC SURFACES FROM ALUMINUM AND PLUMBITE-TREATED CELLULOSICS

Truman L. Ward, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 22, 1974, Ser. No. 499,688

Int. Cl.² B32B *9/04, 9/06*

U.S. Cl. 428—446 **4 Claims**

1. A process for the preparation of glasslike, hard, electrically conductive films adhered firmly to and prepared on the surface of silicon-containing hard surfaces, the process comprising

a. placing a sheet-type cellulosic material that has been treated with an aqueous sodium plumbite or potassium plumbite solution to contain about from 8% to 37% of lead, in contact with and flat against a high silicon content glass or ceramic surface,

b. coating the sheet of (a) with metallic aluminum,

c. inserting the assembled components of (b) into an oven preheated to a temperature below about 200°C,

d. elevating the temperature of the closed oven to about from 600° to 700°C. thereafter maintaining said temperature for about 60 minutes, and

e. cooling the oven and contents gradually to avoid the cracking of the assembled components due to thermal strain.

3,936,581

HARDENABLE COMPOSITIONS

William David Garden, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 29, 1974, Ser. No. 465,439

Claims priority, application United Kingdom, May 3, 1973, 21014/73

Int. Cl.² B32B 27/10

U.S. Cl. 428—447 17 Claims

1. A hardenable composition comprising 80 to 99 parts by weight of a liquid hydroxy-ended diorganopolysiloxane, 1 to 20 parts by weight of a liquid organohydrogenpolysiloxane, an organic sulphur complex of platinum in an amount, calculated as platinum, up to 0.1 part by weight per 100 parts by weight of total organopolysiloxanes, said complex consisting of a compound of platinum containing one or more ligand organosulfur groupings of divalent sulfur which can donate electrons to form a bond with the platinum metal, and a compound containing at least one olefinic double bond in which the remaining valences of the 2 carbon atoms forming the double bond are satisfied by bonding to a hydrogen atom, and ether radical, a silicon atom, a sulphur atom or a carbon atom, the three remaining valences of which are satisfied by bonding atoms selected from carbon, silicon, sulphur, hydrogen and oxygen provided that not more than two of the valences are satisfied by bonding to oxygen, said compound being free from phosphorus, arsenic and divalent sulphur and derivatives of ammonia, wherein the three N valences of said ammonia are satisfied by bonding to an atom from the group S, H, O, N or Si, and said complex being present in amounts such that there is not less than 1 mol of olefinic double bond per g. atom of Pt.

3,936,582

DIFFERENTIAL RELEASE COATED ARTICLES

LeRoy H. Keiser, Clarendon Hills, Ill., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 3, 1974, Ser. No. 475,978

Int. Cl.² B44D 1/10; B32B 7/06; C09J 7/04

U.S. Cl. 428—447 10 Claims

1. A differential release coated article comprising a substrate coated on one side with

I. a low release value cured polyorganosiloxane coating comprising a mixture of

a. a polyorganosiloxane having silicon-bonded hydroxyl groups on the ends of the molecule,

b. a polymethylhydrogensiloxane having an average of at least three SiH groups per molecule and

c. a functional amount sufficient to effect curing of said polyorganosiloxane of a carboxylic acid salt of an organic metallic compound selected from lead, zinc, iron or tin; and

coated on the opposite side with

II. a high release cured polyorganosiloxane coating comprising a mixture of

d. a polyorganosiloxane having silicon-bonded hydroxyl groups on the ends of the molecule,

e. a polymethylhydrogensiloxane having an average of at least three SiH groups per molecule,

f. a three-dimensional highly cross-linked polyorganosiloxane containing triorganosiloxy end groups in which the ratio of the monovalent hydrocarbon radicals to SiO_2 units ranges from about 1.5:1 to about 3:1, and

g. a curing catalyst mixture comprising a functional amount sufficient to effect curing of said polyorganosiloxane of a carboxylic acid salt of an organometallic compound selected from lead, zinc, iron or tin and an organic peroxide.

3,936,583

PREVENTION OF CORROSION IN METALS

Geoffrey Oliver Lloyd, Twickenham; John Ernest Rhoades-Brown, Hanworth, and Stuart Richard John Saunders, New Malden, all of England, assignors to Secretary of State for Trade & Industry in Her Britannic Majesty's Govt. of U.K. of Gt. Britain & Northern Ireland, London, England

Filed Oct. 25, 1973, Ser. No. 409,592

Claims priority, application United Kingdom, Oct. 26, 1972, 49460/72

Int. Cl.² C23F 7/00

U.S. Cl. 428—450 7 Claims

1. A process for the protection of the surface of an article, said surface being an iron or nickel alloy which contains at least 1 per cent by weight of chromium, against high temperature oxidation comprising contacting the same article with a solution or a suspension of a material selected from the group consisting of borax, sodium metaborate, zinc borate and boric acid, in a volatile polar organic solvent, whereby, after removal of the solvent, a film weighing at least 3 $\mu g/cm^2$ of the said material is deposited on the surface of the article.

5. A process according to claim 1 wherein the solution or suspension of a borate contains additionally silica or tetraethylorthosilicate.

3,936,584

FORMATION OF POLYPARABANIC ACID COATINGS AND FILMS BY SOLVENT TREATMENT OF POWDERED LAYER

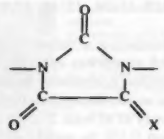
Tad L. Patton, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 17, 1973, Ser. No. 397,646

Int. Cl.² B05D 3/02, 3/04

U.S. Cl. 428—458 24 Claims

1. A method for producing structures from solid polymeric materials having repeating heterocyclic rings of the following structure:



where X is NH or O,

which comprises depositing a layer of a fine powder of said polymer on a supporting substrate and subjecting said powder layer on said substrate to the action of the vapor or spray or mist or fog, of a aprotic dipolar solvent for said powder until said powder particles are wetted with not more than 25 wt. % with solvent, subsequently heating the wetted powders to cause said powder to flow and coalesce below the boiling temperature of said solvent and subsequently heating the resulting coating to remove the absorbed solvent and cause said film to adhere tightly to said substrate unless said substrate has been treated or selected so as not to have an affinity for said polymer.

3,936,585

FIRE RETARDING TEXTILE MATERIALS

Robert Bruce Leblanc, and Destin A. Leblanc, both of Wickford, R.I., assignors to Robert Bruce Leblanc, East Greenwich, R.I.

Filed Dec. 5, 1973, Ser. No. 422,058
Int. Cl.[2] D06M *13/44*
U.S. Cl. 428—921 12 Claims

1. The process for rendering a textile material fire retardant comprising impregnating a textile material with an aqueous solution of a condensation product of a poly(α-hydroxyalkyl)-phosphorus compound of the formula

$(RCHOH)_n(RCHR')_{4-n}$ P-Y

or

$(RCHOH)_m(RCHR')_{3-m}$ P

and a nitrogen compound of the formula RNH_2,HD—R'' NH_2 or

wherein

each R is independently hydrogen or alkyl of 1 to 3 carbon atoms,

R' is OR or

R'' is alkylene of 1 to 3 carbon atoms,

Y is at least one anion selected from the group consisting of chloride, sulfate, phosphate, acetate and formate,

n is an integer from 2 to 4, and

m is an integer from 2 to 3,

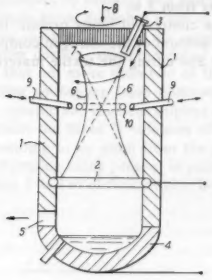
the phosphorous compound being present in about 0.5 to 6 times the molar amount of the nitrogen compound, drying the textile material, and curing the textile material by heating.

3,936,586

ARC FURNACES AND TO METHODS OF TREATING MATERIALS IN SUCH FURNACES

Josef Kazimierz Tylko, Faringdon, England, assignor to Tetronics Research and Development Co. Ltd., Faringdon, England

Filed Apr. 30, 1975, Ser. No. 572,956
Claims priority, application United Kingdom, May 7, 1974, 20160/74
Int. Cl.² H05B 7/10
U.S. Cl. 13—9 R 12 Claims



1. In a plasma arc furnace comprising a furnace body, a stationary electrode mounted in said furnace body and at least one orbiting electrode movable in a substantially circular path, means for moving said electrode about its orbital axis of rotation with sufficient velocity to develop a radially-expanded plasma column in a zone lying between the path of said orbiting electrode and said stationary electrode and means for introducing feedstocks into the plasma column, the improvement which comprises directing the orbiting electrode inwardly toward the axis of rotation and at a point on the stationary electrode so as to generate a plasma column having a portion of generally inverted conical shape in the vicinity of the orbiting electrode.

3,936,587

ELECTRODE CONSTRUCTION FOR RESISTANCE HEATING FURNACE

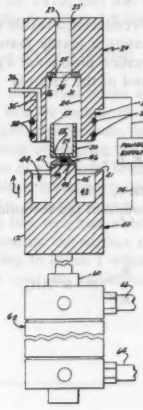
George J. Sitek, Stevensville; Robert N. Revesz, and Charles W. Berk, both of St. Joseph, all of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed June 28, 1974, Ser. No. 484,453
Int. Cl.² F27D 11/02; H05B 3/08
U.S. Cl. 13—23 19 Claims

1. For use in a furnace for heating an electrically resistive crucible held between electrodes, improved electrode construction comprising:

a pair of electrodes made of an electrically conductive material, at least one of said electrodes movable toward and away from the remaining electrode for alternately clamping and releasing an electrically resistive specimen-holding crucible between said electrodes; and

a thin insert mounted to said at least one electrode to contact said crucible, said insert comprising an electrically conductive material with a melting point exceeding about 2500° Centigrade.

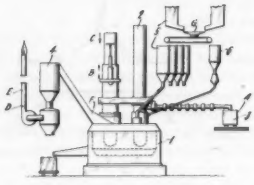


3,936,588

CONTROL SYSTEM FOR ELECTRICAL FURNACES

Bjorn Asphaug, Vagsbygd, and Thor Pedersen, Hauketo, both of Norway, assignors to Elkem-Spigerverket, Oslo, Norway

Continuation-in-part of Ser. No. 342,394, March 19, 1973. This application Dec. 4, 1974, Ser. No. 529,264
Claims priority, application Norway, Mar. 20, 1972, 895/72
Int. Cl.² F27D 3/10
U.S. Cl. 13—33 16 Claims



1. A control system for electrical furnaces comprising:

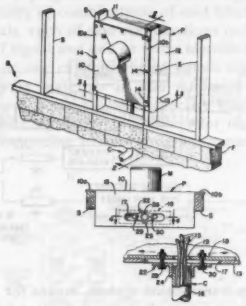
1. computer means operative to receive a plurality of input signals indicative of metallurgical process parameters, and further operative to process said plurality of input signals and to generate a plurality of output signals for controlling the quantity and mixture of charge fed to the associated furnace, for controlling the position of the electrodes in the associated furnace, and for controlling the power consumed by the associated furnace; and
2. charge feed means operative in response to at least one of said plurality of output signals to feed and control the quantity and mixture of charge to the associated furnace.

3,936,589

ELECTRIC SERVICE PANEL FOR UNDERGROUND SERVICE INSTALLATIONS HAVING ADJUSTABLE CONDUIT ATTACHING MEANS

Darrel L. Teeters, Sr., P. O. Box 401, and Garey D. Teeters, 35213 Date St., both of, Yucaipa, Calif. 92399

Filed June 21, 1974, Ser. No. 481,767
Int. Cl.² H02G 3/06
U.S. Cl. 174—65 R 1 Claim



1. An electric service panel for underground service installations, wherein an electrical cable means including a cable inside a rigid conduit for supplying electric power to the service panel leads to the service panel from below ground, said service panel having a front wall, opposite side walls and a bottom wall, said bottom wall having an elongate opening therein through which the cable can enter the service panel, conduit attaching means at the bottom wall for receiving and holding the end of the conduit, said conduit attaching means being laterally adjustable relative to the opening in the bottom wall to compensate for misalignment between the conduit and service panel and comprising a rectangular adapter plate disposed inside the service panel against the bottom wall thereof in overlying relationship to the opening through the bottom wall to close the opening, a hub means below the bottom wall, said hub means having flange means thereon engaged against the underside of the bottom wall at the edges of the opening, said adapter plate and hub means having aligned openings therethrough through which the cable can extend, said adapter plate having a size in relation to the size of the opening such that it effectively closes the opening in all adjusted positions of the attaching means, and fastening means extending through said flange means and through said opening and through said adapter plate to securely clamp the adapter plate and hub means on opposite sides of the bottom wall in adjusted position relative to the opening.

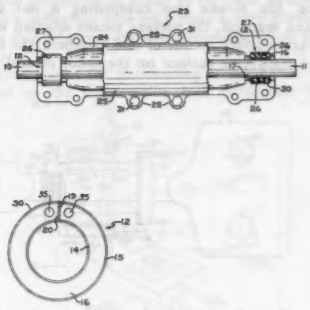
3,936,590

SEAL RING AND SPLICE ENCLOSURE

Philip A. Albano, 10311 Tanager Trail, Brecksville, Ohio 44141

Filed Dec. 9, 1974, Ser. No. 530,955
Int. Cl.² H02G 15/08
U.S. Cl. 174—92 6 Claims

1. An electrical seal ring comprising an annular deformable member; said member having an inner circumferentially extending surface and an outer circumferentially extending surface; said member having a slit that extends from said inner circumferentially extending surface to said outer circumferentially extending surface to provide a pair of spaced end faces adapted to abuttingly engage each other to form a closed annular ring; and deformable tape means encircling said annular member by extending along said entire outer circumferential surface, said entire inner circumferential surface, and at least one of said end faces.

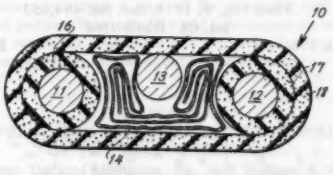


3,936,591

NONMETALLIC-SHEATHED CABLE

Lambert C. Smith; Verne A. Meridith, both of Athens, Ga., and Robert M. Wade, Wabash, Ind., assignors to The Anaconda Company, Mont.

Filed July 5, 1974, Ser. No. 486,042
Int. Cl.² H01B 11/02
U.S. Cl. 174—116 6 Claims



1. A nonmetallic-sheathed cable comprising
A. a plurality of conductors comprising a metal selected from the group consisting of copper and aluminum,
B. a wall of expanded polyvinyl chloride insulation surrounding each of said conductors, said wall comprising 8–24%, by volume, of gas,
C. a thin-walled tubular jacket of expanded polyvinyl chloride surrounding the totality of said insulated conductors said jacket comprising 8–24%, by volume, of gas.

3,936,592

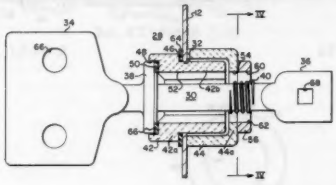
ELECTRICAL BUSHING HAVING A CENTRAL CONDUCTOR WITH LARGE PLANAR TERMINAL PORTIONS AT EACH END

James R. Gamble, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 2, 1975, Ser. No. 538,065
Int. Cl.² H01B 17/26
U.S. Cl. 174—153 R 3 Claims

1. An electrical bushing suitable for extending through an aperture in a housing wall, the bushing comprising a pair of tubular insulating members having oppositely disposed facing surfaces adapted to engage opposite sides of a housing wall, a conductor extending through the members and having first and second longitudinally extending planar terminal surfaces,

means on the conductor for clamping the insulating members in place against said opposite sides and comprising an integral flange having surface means on the conductor near the first planar terminal surface, the means also comprising a threaded segment on the conductor near the second planar terminal surface, the means also comprising a nut engaging the threaded segment, the surface means adapted to abut a first transverse surface on one of said members, the nut abutting a second transverse surface on the other of said members for

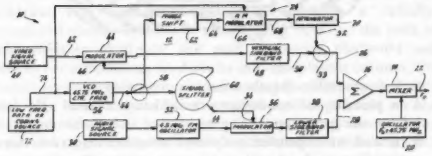


holding the pair of tubular insulating members in place on a housing wall, the first and second planar terminal surfaces having transverse dimensions greater than the diameter of the threaded segment, the second planar terminal surface being insertable through the tubular insulating members, the nut comprising aperture means including a threaded portion and a slot portion extending outwardly from said threaded portion, and the second planar terminal surface being passable through the aperture means.

3,936,593
SCRAMBLER AND DECODER FOR A TELEVISION SIGNAL

Gerald Aaronson, Brookline, and William D. Murphy, Burlington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 5, 1974, Ser. No. 494,653
Int. Cl.² H04N *1/44*
U.S. Cl. 178—5.1 **20 Claims**



1. In a system for scrambling and decoding a television signal modulated on a normal carrier which is replaced with a scrambling carrier having the same frequency as the normal carrier but with a predetermined phase difference therefrom and where the scrambled television signal is decoded at a receiving end by regenerating the normal carrier from the scrambling carrier for the latter's replacement by the regenerated normal carrier the improvement comprising

means for generating a coding signal of a frequency selected to enable modulation of the scrambling carrier for enhanced security;

means responsive to the coding signal for amplitude modulating of the scrambling carrier;

means responsive to the coding signal for frequency modulating of the scrambling carrier;

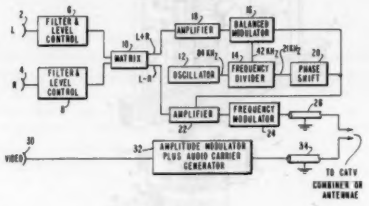
means at the receiving end for detecting the frequency modulation to reproduce the coding signal; and

means for replacing the scrambling carrier at the receiving end with the inverse amplitude modulated normal carrier to provide a normally displayable television signal.

3,936,594
SECURE TELEVISION SYSTEM

Mark Schubin, Hoboken, and George Andersen, Dumont, both of N.J., assignors to Lincoln Center for the Performing Arts, Inc., New York, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,819
Int. Cl.² H04N *1/44*
U.S. Cl. 178—5.1 **5 Claims**



1. In a television transmission system, means for transmitting a television program including means for transmitting the video portion of the television program on a video channel and means for transmitting the audio portion of the television program stereophonically on a separate audio channel unrelated in frequency to said video channel, said audio channel transmission means including a first source of audio information and a second source of audio information, means for combining said first and second audio signals to produce a sum combination of said audio signals and a difference combination of said audio signals, means for deriving a subcarrier wave having a frequency which is at least twice as high as the highest frequencies in said audio signals, means for amplitude modulating said subcarrier wave with said sum combination of audio signals to produce sum combination signal sidebands in such manner that said subcarrier wave is suppressed, means for deriving a pilot carrier wave having a frequency related to the frequency of said subcarrier wave, the frequency of said pilot wave not at the frequency of 19 kHz, means for applying said difference combination of audio signals, said sum combination signal sidebands and said pilot signal to a frequency modulator so as to frequency modulate a carrier wave with said difference combination audio signal, said sum combination sideband signal and said pilot signal for transmission with the video portion of said television program.

3,936,595
SIGNAL TRANSMISSION SYSTEM FOR TRANSMITTING PROGRAMED INFORMATION SUCH AS PROGRAMED INSTRUCTION

Akio Yanagimachi, Kawasaki; Takashi Uehara, Inagi; Tetsuo Yamamoto, Machida; Hisakichi Yamane, Tokyo; Eiichi Sawabe, Machida; Takehiko Yoshino, Yokohama; Teruhiro Takezawa, Komae; Michio Masuda, Tokyo; Hiroaki Nabeyama, Yokohama; Masaaki Fukuda, Kodaira, and Tatsuo Kayano, Hachioji, all of Japan, assignors to Nippon Hoso Kyokai; Hitachi, Ltd. and Hitachi Electronics Co., Ltd., all of Tokyo, Japan

Filed Aug. 29, 1973, Ser. No. 392,557
Claims priority, application Japan, Sept. 4, 1972, 47-88553
Int. Cl.² H04N *7/08*; G09B *7/04*
U.S. Cl. 178—5.6 **24 Claims**

1. A signal transmission system for transmitting programmed information including signals corresponding to a plurality of program materials, comprising at a transmitter end:

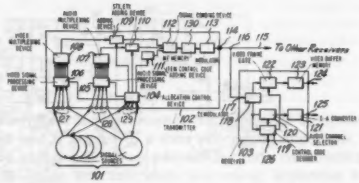
a program material source for producing said signals corresponding to said plurality of program materials;

means for producing a plurality of identification signals a respective one of which denotes each of said signals corresponding to said plurality of program materials;

means for producing a plurality of label signals each of which denotes a minimum program material group comprising a minimum significant information unit composed of one or more of said signals corresponding to said program materials;

means for receiving said identification and label signals to form a program material control signal composed of a plurality of combinations of said label and identification signals, each of said combinations including a respective label signal and one or more identification signals which denote one or more of said signals corresponding to said program materials in said minimum program material group denoted by said respective label signal;

composite signal forming means for receiving said signals corresponding to said program materials and said program material control signal to form a composite signal; and



means for transmitting said composite signal; and at a receiver end:

means for receiving said composite signal;

means for reproducing at least a part of said program material control signal from the received composite signal;

label determining means for determining a label signal of a minimum program material group to be displayed;

identification signal detecting means for receiving said reproduced program material control signal and said determined label signal to detect one or more identification signals which form one of said combinations in said reproduced program material control signal together with said determined label signal;

means for extracting from the received composite signal a minimum program material group of one or more of said signals corresponding to said program materials denoted by said one or more detected identification signals; and

means for displaying said one or more extracted signals corresponding to said program materials.

3,936,596

OPTICAL PROJECTION APPARATUS

Masafumi Inuiya, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 22, 1974, Ser. No. 435,626

Claims priority, application Japan, Jan. 22, 1973, 48-9361

Int. Cl.² G08B *5/00;* H04N *7/14, 7/18*

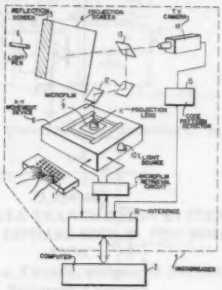
U.S. Cl. 178—6 **6 Claims**

1. An optical projection apparatus including a projection screen on which a microimage is projected on an enlarged scale and adapted to be connected with an information processing system comprising;

microfilm feeding means which feeds and stops a microfilm on which a plurality of images are recorded, each image of said microfilm comprising an image frame portion and a code pattern portion recorded adjacent the image frame, each code in the code pattern portion representing information concerning a part of the image of the image frame portion positioned at a position corresponding to said code,

an optical projection system for projecting an image of the image frame portion onto a transmission type projection screen and projecting an image of the code pattern portion onto a reflection type projection screen provided in a side by side relation with said transmission type projection screen,

a light source means for illuminating a part of the image projected on the transmission type projection screen



selectively from the opposite side of said optical projection system,

means for taking a view of the screen from the side of the projection system and putting out an image signal representing the view taken thereby, signal conversion means for receiving said output image signal and converting said signal into a computer input signal representing the information concerning a part of the image of said image frame portion illuminated by said light source means, and

control means for controlling said microfilm feeding means according to an output signal of the computer.

3,936,597

VIDEO FREQUENCY AMPLIFIER OPERABLE IN EITHER OF TWO BIAS CONDITIONS

Denis Peter Dorsey, Levittown, Pa., and William E. Rodda, Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 273,534, July 20, 1972, abandoned. This application Sept. 19, 1973, Ser. No. 398,853

Claims priority, application United Kingdom, Apr. 24, 1972, 19021/72

Int. Cl.² H04N *3/00, 3/16*

U.S. Cl. 178—6.8 **7 Claims**

1. In a television image transmission system of the type wherein a single storage device is employed both for the selection of a particular frame of television information for transmission to a remote receiver location by an audio communications link and for the reception and re-creation of frame information so transmitted, the combination therewith of:

an amplifier stage having an input terminal to which image representative television information is supplied and an output terminal at which amplified versions of said image representative information is developed for application to said storage device for the selection or re-creation of said information dependent upon when said device is operating within said system in the transmitting or receiving mode;

first means for biasing said amplifier stage to develop amplified image representative signals of a first magnitude at its output terminal referenced to a first direct current level;

second means for biasing said amplifier stage to develop amplified image representative signals of a second, differ-

ent magnitude at its output terminal referenced to a second, different direct current level;

and control means coupled to said first and second biasing means for conditioning at least one of said biasing means to operation to set the magnitude of developed amplified signals and the direct current level to which said amplified signals are referenced;

said control means also being dependent upon the mode of operation of said storage device within said television

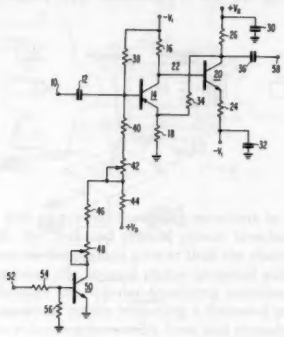


image transmission system to establish Class A amplifier operation and said first signal magnitude and direct current level as a reference when said storage device is employed to select a particular television frame for transmission and to establish Class B amplifier operation and said second signal magnitude and direct current level as a reference when said storage device is employed to re-create a television frame received along said audio communications link.

3,936,598

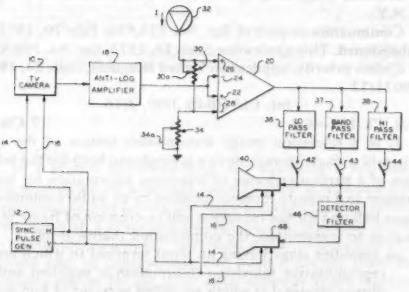
ELECTRONIC IMAGE DENSITY ANALYSIS

John Henry Newitt, 123 Puritan Lane, Sudbury, Mass. 01776

Filed Feb. 14, 1974, Ser. No. 442,445

Int. Cl.[2] H04N *7/02, 7/18*

U.S. Cl. 178—6.8 **9 Claims**



1. In the method of providing a display representative of objects of a scene where a video source provides a camera video signal having an amplitude proportional to an amount of light flux from said scene along a line of sight which traces a raster on said scene, the steps of:

providing a density signal having an amplitude proportional to the antilogarithm of the amplitude of said camera video signal;

comparing said density signal with a known range of density signals and providing a processed video signal having first and second amplitudes in response to said density signal being respectively within and outside of said known range; and

displaying an image in response to selected frequency components of said processed video signal.

3,936,599

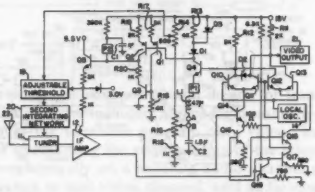
AUTOMATIC GAIN CONTROL SYSTEM

William Peil, North Syracuse, and Joseph P. Hesler, Liverpool, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 370,916, June 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 304,564, Nov. 7, 1972. This application Apr. 30, 1975, Ser. No. 573,190

Int. Cl.[2] H04N *5/52*

U.S. Cl. 178—7.3 DC **16 Claims**



1. An AGC system comprising:

a. a demodulator of modulated signals containing spaced repetitive pulses representing a maximum carrier level,

b. a first amplifier for said modulated signals whose output is coupled to said demodulator and whose gain is subject to electrical control, and

c. a feedback network not requiring gating to produce a control voltage from said pulses suitable for automatic gain control of said first amplifier, said feedback network comprising:

1. a second amplifier coupled to the output of said demodulator having a threshold set at less than the maximum carrier level to produce output pulses consisting of portions of said repetitive pulses in excess of said threshold,

2. a third amplifier coupled to the output of said second amplifier for non-linearly amplifying said thresholded pulses as a function of their magnitude, said third amplifier having an output characteristic having an initial slope of one sign and reproducing said thresholded pulses in the output in a first current direction; followed by a change in slope in said output characteristic to one of opposite sign, continuing until the pulses in the output have a second, reversed current direction, said second sloping region providing a gain stabilizing action when said feedback loop is closed, said third amplifier having negligible output current in the absence of input current,

3. an integrating network comprising a storage capacitor shunting the output of said third amplifier for providing a smoothed gain control voltage from said non-linearly amplified thresholded pulses, and

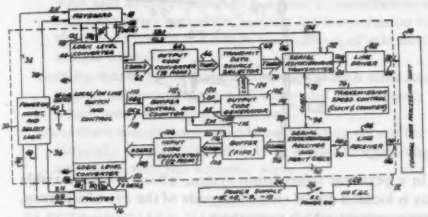
4. means to couple said integrating network to said first amplifier to increase or decrease the gain thereof about a quiescent point as said third, non-linear amplifier supplies current to or withdraws current from said integrating network as a function of signal strength.

3,936,600

KEYBOARD-PRINTER TERMINAL INTERFACE FOR DATA PROCESSING

Robert E. Galbraith, Pontiac, Mich., assignor to World Computer Corporation, Birmingham, Mich.

Filed Aug. 21, 1974, Ser. No. 499,140
Int. Cl.² H04L 11/00
U.S. Cl. 178—17.5 6 Claims



1. An interface for interconnecting a terminal comprising a keyboard and a printer to a data processing apparatus, said keyboard and printer being adapted for data communication in parallel code and said data processing apparatus being adapted for data communication in serial code, said interface comprising control means for placing said keyboard and printer in direct communication with each other in a first mode of operation and in communication with said data processing apparatus in a second mode of operation, serial asynchronous transmitter means for converting said data from parallel to serial code and for supplying said serial coded data to said data processing apparatus through a first transmission line, transmit data source selector means for supplying command data to said data processing apparatus, serial asynchronous receiver means for converting data received from said data processing apparatus through a second transmission line from serial to parallel code, buffer storage means for storing said received data and for supplying said stored data to said printer, storage control means for controlling said buffer storage to supply said stored data to said printer only when said printer is in a ready state and up-down counter means for controlling said transmit data source selector means for commanding said data processing apparatus through said first transmission line to stop transmission when said buffer storage means is nearly full and to resume transmission when said buffer storage means is nearly empty.

3,936,601

METHOD AND APPARATUS FOR ALTERING THE SYNCHRONOUS COMPARE CHARACTER IN A DIGITAL DATA COMMUNICATION SYSTEM

Carl Obeginski, South Lyon, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 28, 1974, Ser. No. 473,716
Int. Cl.² H04K 1/00; H04L 7/04
U.S. Cl. 178—22 6 Claims

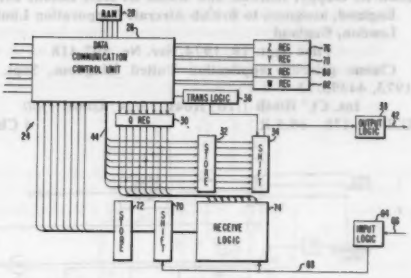
2. A method for transmitting digital data to a receiving apparatus in a synchronous mode comprising the steps of:

generating a first synchronous character;

transmitting said first synchronous character to the receiving apparatus;

transmitting a first message in digital form to the receiving apparatus; and

generating different synchronous characters in a preselected nonrepetitious pattern to provide dynamically altered characters to precede future message transmissions thereby preventing unauthorized interception thereof.

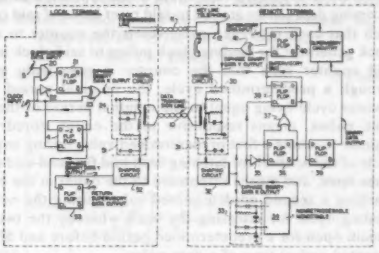


3,936,602

FULL DUPLEX DATA TRANSMISSION SYSTEM USING TWO SPEEDS OF DIPHASE SIGNAL FOR SIMPLIFIED SYNC

Klaas Korver, Ottawa, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Oct. 23, 1974, Ser. No. 517,218
Int. Cl.² H04J 3/06
U.S. Cl. 178—58 R 4 Claims



1. A method for exchanging data between local and remote terminals, via a two wire transmission line, the method comprising the steps of:

a. in the local terminal, transmitting a coded diphase signal having first and second portions, respectively representing data bits of first and second states, the first portions having two transitions per data bit and the second portion having four transitions per data bit; and

b. in the remote terminal, receiving the coded diphase signal,

c. generating, from the received coded diphase signal, first signals at the baud rate of the coded diphase signal and synchronized therewith and second signals at half of said baud rate and in phase with said first portions,

d. decoding the received coded diphase signal in synchronism with the first and second signals, to derive the data bits,

e. transmitting a diphase signal, at half the baud rate of the coded diphase signal, synchronized with said second signal and representing other data bits; and

f. in the local terminal receiving the diphase signal delayed by less than half the period of the baud rate of the coded diphase signal,

g. decoding the diphase signal in synchronism with a signal in phase with said first portions, to derive the other data bits.

3,936,603

DIGITAL COMMUNICATION SYSTEMS

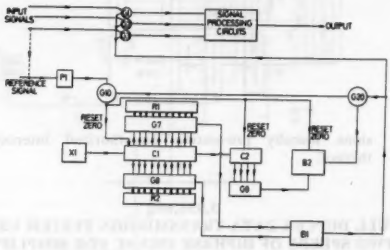
John R. Guppy, Hitchin, and Robin D. Roe, Luton, both of England, assignors to British Aircraft Corporation Limited, London, England

Filed Sept. 19, 1974, Ser. No. 507,418

Claims priority, application United Kingdom, Sept. 21, 1973, 44395/73

Int. Cl.² H04B 1/16; H04L 15/24; G06G 7/00

U.S. Cl. 178—69.5 R 4 Claims



1. A receiver for use in a digital communication system in which incoming data pulses occur at fixed intervals, the receiver including a data processing circuit, a first gate through which incoming data pulses are passed to said data processing circuit, a counter having a reset input and a clock input, a second gate through which reference pulses having a predetermined pulse repetition rate equal to the repetition rate of the incoming data pulses are fed to said reset input of said counter such that each reference pulse resets the counter to zero, a clock generator for feeding clock pulses to said clock input of said counter such that the counter is repeatedly stepped through a predetermined cycle, the nominal period of the counter cycle being equal to the nominal period of the reference pulses, means responsive to the count stored in the counter reaching a first predetermined value during any given cycle of the counter for latching both said first and said second gates open, and means responsive to the count in the counter reaching a second predetermined value during the next succeeding cycle for releasing the latch whereby the two gates remain open for a predetermined period before and after the expected arrival time of a data pulse.

3,936,604

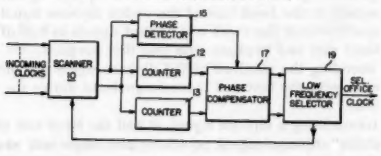
SYNCHRONIZATION OF CLOCKS IN DIGITAL SIGNALLING NETWORKS

Uwe A. Pommerening, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 97, Jan. 2, 1970, abandoned. This application Feb. 20, 1975, Ser. No. 551,495

Int. Cl.² H04L 7/00

U.S. Cl. 178—69.5 R 3 Claims



1. Method of synchronizing a signalling network of the pulse code modulated type having a plurality of local offices more than one of which has an independent clock for producing clock signals to time its operation comprising synchronizing all the local offices in accordance with the slowest clock in the network.

3,936,605

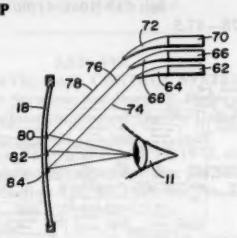
EYEGLASS MOUNTED VISUAL DISPLAY

Hubert W. Upton, Arlington, Tex., assignor to Textron, Inc., Providence, R.I.

Filed Feb. 14, 1972, Ser. No. 225,741

Int. Cl.² G02B 17/00

U.S. Cl. 179—1 SP 21 Claims



1. In a personal information system where a light variable display is located out of view at the side of the eye of a person, the improvement which comprises:

a. a generally spherical mirror subtending a solid angle of not more than about 7° of the field of vision of said person when positioned in front of said eye at a distance less than the minimal focal length of said eye, and

b. structure for supporting said mirror at about said distance from said eye and for supporting said display at about the focal length of said mirror at a location such that the mirror axis bisects the angle between said light source and said eye.

19. The method of assisting speech interpretation which comprises:

a. forming by reflection from a magnifying mirror subtending a solid angle of not more than about 7° in the field of vision on an eyeglass in focus images of an information source located at about the focal plane of said mirror in response to frictional, plosive, and vowel voicing characteristics.

3,936,606

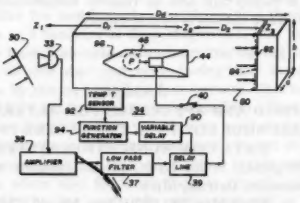
ACOUSTIC ABATEMENT METHOD AND APPARATUS

Ronald L. Wanke, 1960 N. Lincoln Park West, Chicago, Ill. 60614

Continuation-in-part of Ser. No. 205,598, Dec. 7, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 313,958

Int. Cl.² H04R 1/28

U.S. Cl. 179—1 P 39 Claims



1. A method for attenuating a predetermined range of frequencies within an acoustic wave propagating along different vectors through a medium, comprising the steps of:

generating an anti wave limited to only said predetermined range of frequencies and of mirror symmetry with respect to said acoustic wave,

propagating said anti wave in said medium along a given vector which is at a skew with respect to one of said different vectors,

altering a vector of at least one of said waves to produce substantially coinciding vectors of propagation only for the predetermined range of frequencies, and

aligning the wavefront of at least one of said waves to produce substantially coinciding wavefronts.

29. A system for attenuating an acoustic wave propagating through a medium, comprising:

source means including receiver means for detecting said acoustic wave, transmitter means responsive to said receiver means for producing an anti wave which interferes with said acoustic wave to produce a cancellation effect, and time delay means for varying the transmission time of the source means to change the position of said anti wave in said medium,

sensing means for sensing a condition which indicates misalignment between the anti wave and the acoustic wave which were initially aligned, and

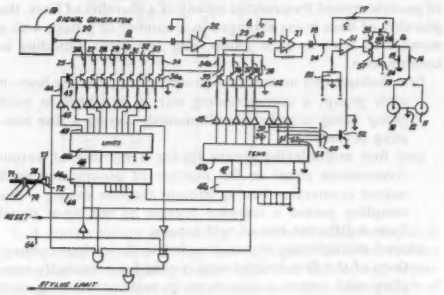
correction means responsive to said sensing means for automatically varying said time delay means to again align the anti wave with the acoustic wave.

3,936,607

ELECTRONICALLY VARIABLE AUDIOMETER OF THE VON BEKESY TYPE

Sidney Gordon, New York, N.Y., assignor to Michael Davis, Riverdale, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,602
Int. Cl.² H04R *29/00*
U.S. Cl. 179—1 N **15 Claims**



10. A controllably effective voltage divider output for an electronically attenuated audiometer circuit or the like, which comprises

a. first and second resistance means connected in series,

b. at least a portion of the second resistance means constituting an output load,

c. said first resistance being a multiple of the second,

d. electronically attenuated power means for supplying power to said voltage divider input, and

e. circuit means effective when actuated to effectively neutralize the effect of said first resistance means,

f. said circuit means including a unity gain operational amplifier and a transistorized current amplifier.

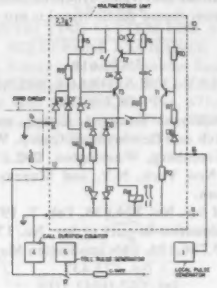
3,936,608

MULTIMETERING FOR TELEPHONE SWITCHING SYSTEMS

Ole Svein Danielsen, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 26, 1974, Ser. No. 492,048
Int. Cl.² H04M *15/12*
U.S. Cl. 179—7.1 R **7 Claims**

1. A multimetering method adaptable to existing telecommunication switching systems in which the establishment of a connection between a calling subscriber and a called subscriber is effected at least partly via a cord circuit and where the calling subscriber is allocated a call duration counter which is arranged to be stepped forward by periodic metering signals generated by a metering signal generator, characterized in that the metering signals, which are common for all subscribers, are continuously led to an inhibiting circuit for



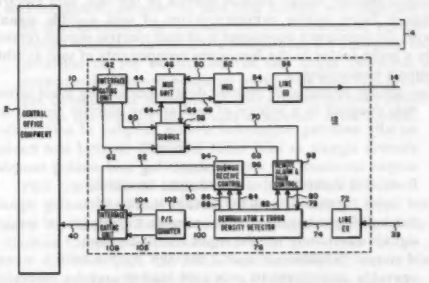
each subscriber which in dependence on whether his call duration counter is connected to the cord circuit or not, respectively feeds the metering signals further towards his call duration counter or stops these signals.

3,936,609

SUBMULTIPLEX TRANSMISSION OF ALARM STATUS SIGNALS FOR A TIME DIVISION MULTIPLEX SYSTEM

Gary C. Waldeck, Foster City, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 14, 1974, Ser. No. 442,522
Int. Cl.² H04J *3/14*
U.S. Cl. 179—15 BF **5 Claims**



1. In a common channel signaling system wherein a predetermined number of equal interval time-divided spaces comprise a frame which includes; a space for a system framing signal, a plurality of spaces for transmission of signaling information, and a space for carrying one of a plurality of status signals, *n*, during each frame, apparatus for time sequencing said status signals for transmission of one status signal each frame, which comprises:

means for deriving said predetermined number of equal interval time-divided spaces, including the status space and for deriving the system frame synchronization signal for each frame;

submultiplexing means operatively connected to said deriving means and arranged to accept *n*-1 status signals for time multiplexing, said submultiplexing means including means for creating a submultiplexer frame status signal and combining means operatively connected to said system frame synchronizing signal and said submultiplexer

frame status signal; said combining means generating a synchronizing signal for transmission every n^{th} frame when both the system frame synchronizing signal and the submultiplexer frame status signal are recurrent; and generating a loss of synchronization signal for transmission when either said frame synchronization signal or said submultiplexer frame status signal is not recurrent.

3,936,610

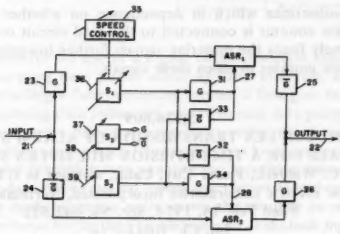
DUAL DELAY LINE STORAGE SOUND SIGNAL PROCESSOR

Murray M. Schiffman, Westport, Conn., assignor to Cambridge Research and Development Group, Westport, Conn.; Sanford D. Greenberg, Washington, D.C.; DT Liquidating Partnership, New York, N.Y. and Murray M. Schiffman, Westport, Conn.

Continuation of Ser. No. 224,035, Feb. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 171,571, Aug. 1, 1971, Pat. No. 3,786,195. This application May 28, 1974, Ser. No. 473,437

Int. Cl.[2] H04J 3/18

U.S. Cl. 179—15.55 T 2 Claims



1. A processor for analog electric signals representing coded audible signals such as speech or the like, said electric signals being analog representations of said audible signals with the frequency components of said electric signals related by a given factor to the frequency components of said audible signals comprising:

two similar analog shift register delay lines having input terminals coupled to a source of said analog electric signals for serially entering sequential analog samples of said analog electric signals at said input terminals thereof and having output terminals for serially removing said analog samples from said delay lines at said output terminals;

said input terminals coupled to said source of analog signals through input switch means operable to supply said analog signals alternately to said input terminals; and

said output terminals coupled through output switch means operable alternately to pass said analog samples emerging from said delay lines;

first and second predetermined frequency clock sources for clocking said delay lines;

means for controlling said delay lines alternately from said clock frequency sources for simultaneous alternate serial entry and removal of said analog samples at said first and second clock frequencies, respectively, to produce predetermined frequency transformation for signals made up of the sequence of said analog samples emerging at said output terminals of said delay lines, said means for controlling said delay lines also controlling said input and output switches to input one said line while outputting the other said line and vice-versa; and

analog signal processing means coupled to said output terminals of both said delay lines through said output switch means and responsive to said analog samples emerging alternately from said delay lines which have been subject to said predetermined frequency transformation for producing an output analog signal reproducible as an audible representation of said electric signals having frequency components altered by substantially the inverse of said factor to approximate the frequency components of said audible signals.

3,936,611

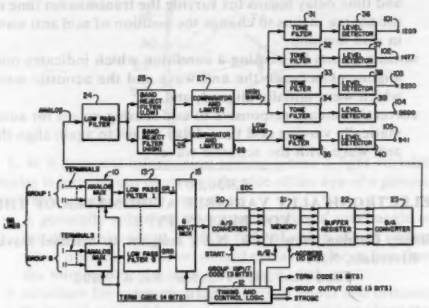
TIME COMPRESSION SCANNER

Margaret A. Poole, Wayland, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 4, 1974, Ser. No. 502,933

Int. Cl.[2] H04B 1/66

U.S. Cl. 179—15.55 T 10 Claims



1. Scanning apparatus for detecting the presence of signals of predetermined frequencies on any of a plurality of lines, the plurality of lines being arranged in a number of groups with a number of lines in each group, said apparatus including in combination

first multiplexing means for repeatedly sampling the lines of each group, a corresponding one of the lines in each group being sampled simultaneously during a line sampling period;

said first multiplexing means having a number of output connections equal to the number of groups and each output connection having present thereon during a line sampling period a sampled portion of the input signal from a different one of said groups;

second multiplexing means coupled to the output connections of the first multiplexing means for repeatedly sampling said output connections in sequence during each line sampling period, and for producing at its output connection a multiplicity of analog samples of each of said sampled portions;

analog-to-digital converting means coupled to the output connection of the second multiplexing means for converting in sequence each of said analog samples to a digital sample;

memory means coupled to said analog-to-digital converting means for storing said digital samples;

memory readout means for reading out of the memory means the digital samples associated with each of the groups of lines, all of the samples associated with a group being read out for each group in turn, the multiplicity of digital samples associated with a group being read out in the same sequence as the analog samples associated with that group were produced by the second multiplexing means;

digital-to-analog converting means coupled to the memory means for converting each of said digital samples to an analog pulse;

filter means coupled to the digital-to-analog converting means for converting the multiplicity of analog pulses associated with a group of lines to an analog signal, the signal frequencies present in an analog signal being equal to the predetermined frequencies present in the associated sampled portion of the input signal times the number of groups;

detecting means coupled to the filter means for determining the presence or absence of each of the signal frequencies

in the analog signal and for producing indications thereof which indicate the presence or absence of each of the predetermined frequencies in the associated sampled portion of the input signal; and

line address means for producing line identifying signals designating the particular group and particular line of the group with which said indications are associated.

3,936,612
CONTROL AND HOLDING CIRCUIT FOR RELAY MATRICES

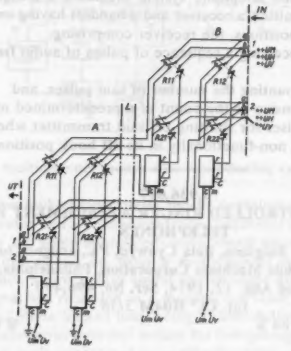
Royne Gunnar Hjortendal, Sorunda, and Jöns Kurt Alvar Olsson, Tullinge, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed June 5, 1974, Ser. No. 476,412

Claims priority, application Sweden, June 27, 1973, 7309028

Int. Cl.² H04Q *1/52*

U.S. Cl. 179—18 GE **11 Claims**



1. A matrix switch comprising a matrix of relays arrayed in groups, each of said relays having signal transfer contact means and an energizing means with first and second terminals, a plurality of first signal transfer terminal means, each of said first signal transfer terminal means being connected in parallel to the signal transfer contact means of one of the relays in each of said groups of relays, a plurality of second signal transfer terminal means, each of said second signal transfer terminal means being connected in parallel to the signal transfer contacts of fall of the relays in a different group of said groups of relays, a plurality of first control current terminals, each of said first control current terminals being connected in parallel to the first terminal of the energizing means of one of the relays in each of said groups of relays, a plurality of second control current terminals, a plurality of control and holding circuits each associated with a different one of said groups of relays, each of said control and holding circuits having a control signal input for receiving a marking signal, and first and second control current transfer means, each of said control and holding circuits having switching means connecting said first and second control current transfer means and rendered conductive when a marking signal is received at its control signal input and at least a given current is available for flowing from one to the other of its control current transfer means and is rendered non-conductive thereafter when the available current is less than said given current, means for connecting first control current transfer means of each of said control and holding circuits in parallel to the second terminals of the energizing means for each relay in the associated group, means connecting the second control current transfer means of each of said control and holding circuits to a different one of said second control current terminals, means for selectively applying marking signals to the control signal inputs of said control and holding circuits, and means for selectively applying sources of current with a controllable amplitude across said first and second control current terminals.

3,936,613
CAMP-ON DETECTING SYSTEM FOR AUTOMATIC TELEPHONE EXCHANGE

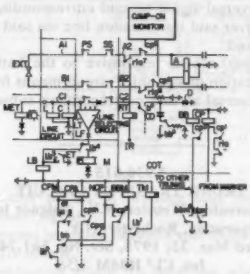
Shogo Nishigori, Kanagawa, and Masahiko Kusama, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 17, 1974, Ser. No. 471,048

Claims priority, application Japan, May 21, 1973, 48-55631

Int. Cl.² H04M *3/42*

U.S. Cl. 179—18 BG **6 Claims**



1. In a common control type automatic telephone exchange having a marker, trunk circuits and subscriber's line circuits associated therewith, a camp-on detecting system comprising, in combination:

first means, coupled to a subscriber's line circuit, for detecting the existence of a prescribed busy potential on the control line of said subscriber's line circuit;

second means, coupled to said first means, and responsive to the existence of a camp-on connection of a trunk circuit with said subscriber's line circuit, for changing the potential on the control line of said trunk circuit to a prescribed camp-on potential only when said first means has detected the presence of said prescribed busy potential on the control line of said subscriber's line circuit.

3,936,614
PBX GROUND START TRUNK INTERFACE FOR STATION CARRIER SYSTEMS

Morris A. Suntop, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,482

Int. Cl.² H04M *7/06*; H04Q *3/62*

U.S. Cl. 179—16 EC **18 Claims**

1. In a station carrier system having a plurality of central office trunks each arranged for communicating by assigned carrier channels to a corresponding one of a plurality of subscriber terminals over a transmission line, each of said central office trunks and each of said subscriber terminals including first and second voice communication leads, a ground start interface circuit comprising:

central office detection means for detecting the application of a ground signal by the central office to the first of the voice communication leads of one of said central office trunks;

first circuit means for communicating the detection of said central office ground signal to the respective subscriber terminal over said transmission line via an assigned ground start carrier channel;

individual subscriber terminal grounding means responsive to the ground detection communication of said first circuit means for applying a ground signal to the first of the

voice communication leads of said respective subscriber terminal;

subscriber terminal detection means for detecting the application of a ground signal by a subscriber to the second voice communication lead of said subscriber terminal;

second circuit means for communicating the detection of a ground signal at said subscriber terminal to the corresponding central office trunk over said transmission line;

central office grounding means responsive to the ground detection communication from said second circuit means for applying a ground signal to the second voice communication lead of said central office trunk;

battery reversal detection means for detecting a battery reversal by the central office at said central office trunk leads;

third circuit means for communicating the detection of said battery reversal signal to said corresponding subscriber terminal over said transmission line via said ground start channel, and

battery reversal means responsive to the battery reversal communication of said third circuit means for effecting a battery reversal at said corresponding subscriber terminal.

3,936,615

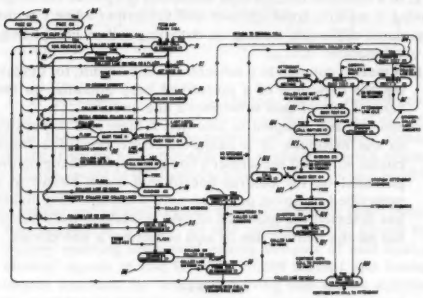
TRUNK TRANSFER CIRCUIT

Uwe A. Pommerening, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Mar. 25, 1975, Ser. No. 561,744

Int. Cl.[2] H04M *3/58*

U.S. Cl. 179—18 AD 14 Claims



1. In a private automatic branch exchange having a solid state switching matrix for connecting local calling stations to local called stations and connecting local stations to incoming and outgoing trunk parties therethrough and a common control for effecting said connections by individual ones of a plurality of local and trunk junctors, having a memory associated with said local and trunk junctors, a trunk transfer circuit comprising:

holding circuit means, responsive to a trunk transfer indication from a transferring local station connected to a trunk transfer party by one of said trunk junctors, for placing the trunk transfer party in a holding status;

forwarding circuit means, responsive to said trunk transfer indication, for forwarding said transferring station to one of said local junctors while said transfer party is in said holding status;

signaling circuit means, directed by said transferring station connected to said one local junctor for signaling a local transferee station of an impending trunk transfer; and

first connecting circuit means, responsive to an answering signal by said local transferee station, for effecting a connection between said trunk transfer party and said transferee station.

3,936,616

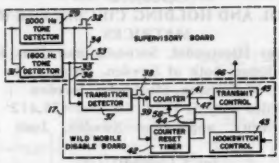
"WILD" MOBILE DISABLE CIRCUIT

Dominic J. DiGianfilippo, Chicago, and Douglas W. Nickerson, East Dundee, both of Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 23, 1974, Ser. No. 508,370

Int. Cl.[2] H04Q *7/04*

U.S. Cl. 179—41 A 7 Claims



2. In a mobile telephone system including a mobile unit having a transmitter, a receiver and a handset having on hook and off hook positions, the receiver comprising:

means for receiving a sequence of pulses of audio frequencies,

means for counting the number of said pulses, and

means responsive to the count of a predetermined number of said pulses for shutting off said transmitter when said handset is non-functionally in its off hook position.

3,936,617

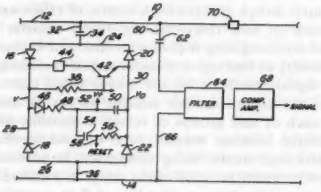
CODE-CONTROLLED RINGER ATTACHMENT FOR TELEPHONES

Duane Ridgely Bolgiano, Bala Cynwyd, Pa., assignor to International Mobile Machines Corporation, Philadelphia, Pa.

Filed Aug. 12, 1974, Ser. No. 496,450

Int. Cl.[2] H04M *3/38*

U.S. Cl. 179—84 R 8 Claims



1. A system for detecting a predetermined transmitted signal comprising a signal transmitter coupled to a signal receiver, a relay coupled between said transmitter and said receiver, said relay acting to inhibit the passage of signals from said transmitter to said receiver when said relay is actuated, actuating means coupled to said relay and to said transmitter, said actuating means being energized by first predetermined signals from said transmitter to actuate said relay and being deenergized in the absence of such signals, a switch means coupled to said transmitter and to said actuating means, said switch means being operated to deenergize said actuating means in response to second predetermined signals from said transmitter, means to reset said switch means to permit energization of said actuating means in the intervals between said second predetermined signals, and a power supply means coupled to said transmitter and to the other components of said system, said power supply means acting to store energy from said first predetermined signals sent by said transmitter and to release said energy to said other components of said system in the intervals between said first predetermined sig-

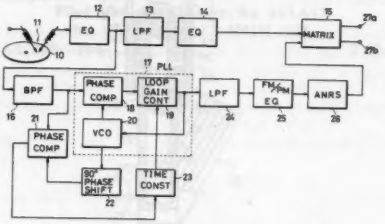
nals from said transmitter, said power supply means being the sole source of power for said system.

3,936,618

MULTICHANNEL RECORD DISC REPRODUCING SYSTEM AND APPARATUS

Nobuaki Takahashi, Yamato; Hideo Onoye, Yokohama; Teruo Muraoka, and Masao Kasuga, both of Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 6, 1974, Ser. No. 448,732
Claims priority, application Japan, Mar. 9, 1973, 48-27715
Int. Cl.[2] G11B 3/00, 3/74
U.S. Cl. 179—100.4 ST 15 Claims



1. A multichannel record disc reproducing system comprising:

a phase locked loop circuit means containing a phase comparator and a voltage controlled oscillator for demodulating an angle-modulated wave signal separated from a signal picked up from a multichannel record disc on which a direct wave signal and an angle-modulated wave signal are recorded in a multiplexed state, the output of said phase locked loop being a demodulated signal;

a synchronous detector means for comparing the phases of said angle-modulated wave signal and the output signal of said voltage controlled oscillator and operating when the phase difference of said two signals deviates from a predetermined phase difference to produce as output a voltage in accordance with the deviation of the phase difference from said predetermined phase difference; and

attenuation means coupled to said phase locked loop for obtaining a demodulated output signal in which the level of at least a frequency band wherein a noise component is distributed has been attenuated in accordance with the output of said synchronous detector.

3,936,619

FOUR-CHANNEL STEREOPHONIC REPRODUCING SYSTEM FOR REPRODUCING DISCRETE CD-4 FOUR-CHANNEL STEREO DISC

Yukio Sugimoto, Katano; Matoto Okamasa, Kyoto, and Toyoshi Fukumura, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

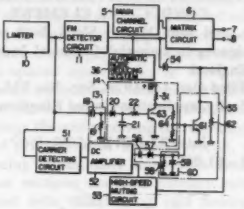
Filed Apr. 24, 1974, Ser. No. 463,667
Claims priority, application Japan, Apr. 25, 1973, 48-48030
Int. Cl.[2] G11B 3/00, 3/74; H04B 5/00
U.S. Cl. 179—100.4 ST 12 Claims

1. A four-channel stereophonic reproducing system for reproducing a discrete CD-4 four-channel stereo disc wherein left and right stereophonic composite signals are recorded on the left and right walls of the groove on said disc, said left stereophonic composite signal comprising the sum of a first main channel signal and a first sub-channel signal and said right stereophonic composite signal comprising the sum of a second main channel signal and a second sub-channel signal, said first main channel signal comprising the sum of first and second channel signals and said second main channel signal comprising the sum of third and fourth channel signals, said first sub-channel signal comprising the frequency-modulated difference between said first and second channel signals and said second sub-channel signal comprising the frequency-modulated difference between said third and fourth channel signals, comprising

means for reproducing a main channel signal and a sub-channel signal having a carrier from each of left and right stereophonic composite signals recorded on said disc;

detector means for detecting said sub-channel signals reproduced by said reproducing means;

matrix means for matrixing said main channel signals reproduced by said reproducing means and output signals from



said detector means to produce four discrete stereophonic audio signals;

switching means provided between said detector means and said matrix means;

level discriminating means for detecting when the carrier level of a sub-channel signal is lower than a predetermined value; and

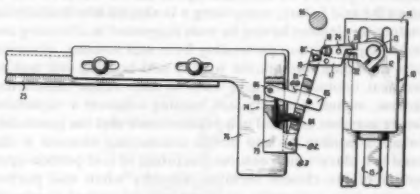
control means controlled by the output of said level discriminating means whereby, when said carrier level becomes lower than said predetermined value, said switching means is rendered nonconductive to prevent application of the output of said detector means to said matrix means.

3,936,620

UNIDIRECTIONAL LIMIT SWITCH ACTUATOR ELEMENT

Bobby J. Williamson, Greenville, S.C., assignor to Southern Machinery Company, Greer, S.C.

Filed Apr. 10, 1974, Ser. No. 459,613
Int. Cl.[2] H01H 3/16
U.S. Cl. 200—47 5 Claims



1. In a limit switch or the like having a rotary switch actuator arm adapted to extend toward the path of movement of a reciprocating machine element, the improvement which comprises a one way engaging and one way inactive switch actuator arm extension freely pivotally secured to the actuator arm and extending on opposite sides of its pivot axis and longitudinally of said arm, the center of mass of said arm extension being eccentric to said pivot axis whereby the extension is weighted to an engaging position in response to gravity, said switch actuator arm having an abutment thereon, a first end terminal on the weighted portion of said extension engaging said abutment under the influence of gravity and being free to separate from the abutment on pivoting of the extension in one direction, and a second end terminal on the other end of

said extension and on the opposite side of said pivot axis and projecting into the path of movement of a machine element to be engaged thereby, engagement of the second end terminal by said machine element moving in one direction causing throwing of the limit switch due to engagement of the first end terminal with said abutment and engagement of the second end terminal by said machine element moving in the opposite direction causing pivoting and yielding of the extension on its pivot and separation of the first end terminal from said abutment without throwing of the limit switch.

3,936,621

DESTRUCTIBLE TYPE SWITCH HAVING FRANGIBLE CONDUCTIVE ELEMENT

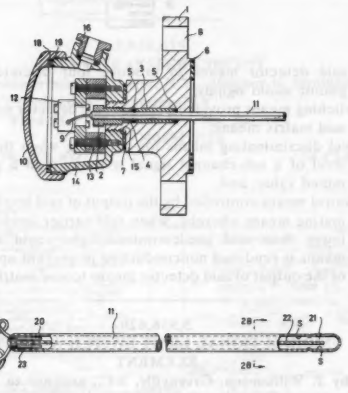
Alfred Palin, and John Wesley Slack, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 15, 1974, Ser. No. 515,018

Claims priority, application United Kingdom, Oct. 17, 1973, 48271/73

Int. Cl.² H01H *35/00, 9/02*

U.S. Cl. 200—61.08 **9 Claims**



1. A detector for the detection of a rupture of a closure member, operable by the breakage of an electrical circuit to detect the said failure, comprising a U-shaped brittle electrical conducting element having its ends supported in a housing and the U-shaped portion protruding from said housing, electrical leads extending through the wall of said housing and making electrical contact with said ends of said brittle conducting element, means mounting said housing adjacent a rupturable closure member in vessel in a position such that the protruding U-shaped portion of said brittle conducting element is disposed in a place which ensures fracturing of said portion upon rupture of the closure member whereby when said portion fractures into a plurality of fragments, electrical continuity between the electrical leads is broken and the fragments cannot dispose themselves in any way which restores the electrical continuity under the conditions consequent upon the failure.

3,936,622

LOAD LIMITER

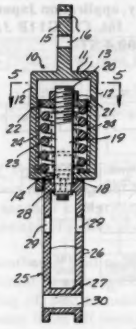
Robert C. McElroy, Libson, Ohio, assignor to Cable Climber Safety Devices Incorporated, Lisbon, Ohio

Filed Apr. 4, 1974, Ser. No. 457,967

Int. Cl.² H01H *3/14*

U.S. Cl. 200—85 R **1 Claim**

1. A load limiter comprising a support member including spaced parallel vertically disposed side walls, spaced parallel, horizontally disposed top and bottom walls, an upper element affixed to said top wall for connection to a hoist, there being an opening in said bottom wall, a vertically disposed moveable rod extending through said opening and said rod having it's upper end threaded, a horizontally disposed vertically moveable plate mounted on the upper portion of said rod, stop guides on said side walls cooperating with said plate for preventing the spring from being deflected out of its proper position on over loads, means mounted above said plate adjustably engaging the upper end of said rod, a coil spring surrounding



said rod and interposed between said plate and said bottom wall, a bracket mounted below said support member and said bracket including a pair of spaced parallel side sections and a bottom portion, means for connecting said bracket to a load, a top piece extending between said side sections and having the lower end of said rod extending therethrough, a vertically disposed support piece affixed to said support member, a micro-switch connected to said support piece, and an adjustment screw connected to the lower end of said micro-switch and to a lug on said upper element.

3,936,623

MULTIPLE CONTACT ROTARY SWITCH OF HELICAL CONFIGURATION

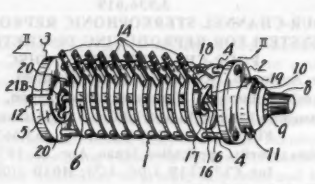
Eitaro Shimoda, 4-7-1, Matsubara, Setagaya, Tokyo, Japan

Filed Sept. 11, 1974, Ser. No. 504,979

Claims priority, application Japan, Sept. 29, 1973, 48-109647; Nov. 8, 1973, 48-129338[U]; Jan. 24, 1974, 49-10659[U]; Feb. 26, 1974, 49-23048[U]

Int. Cl.² H01H *3/40, 19/54*

U.S. Cl. 200—158 **9 Claims**



1. A helical rotary switch comprising:

a. a spiral-shaped helical coil made of insulating material;

b. a plurality of contacts attached to said helical coil;

c. a rotary contact which engages with said helical coil;

d. a slide member to which said rotary contact is attached;

e. a shaft on which said slide member is slidably mounted;

f. a conductor attached to said shaft and said rotary contact electrically contacting with said conductor;

g. a terminal slidably attached one end of said conductor; and

h. a frame member rotatably supporting said shaft; and

i. a second means supporting said helical coil from said frame member,

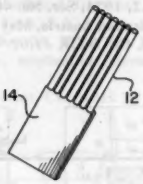
said slide member being so mounted on said shaft that when said shaft is rotated, said slide member is rotated and also moved on said shaft in its axial direction with said rotary contact in electrical contact with said conductor and said rotary contact attached to said slide member and guided by said helical coil and said contacts and said contacts successively electrically connected to said terminal through said conductor and said rotary contact.

3,936,624

MULTIFINGER CONTACT

Stephen Verner Andersen, Burbank, Calif., and Edwin Grant Swick, Bartlett, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 4, 1974, Ser. No. 447,612
Int. Cl.² H01C 1/12; H01H 1/28
U.S. Cl. 200—283 2 Claims



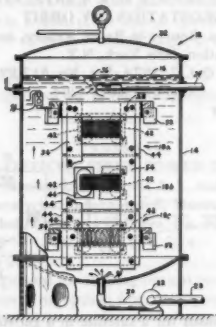
1. An integral, one piece, multifinger electrical contact member formed from a single sheet of conductive material, the contact member including a base portion, a plurality of elongate resilient contact fingers having individual widths and lengths of approximately .005 inch and .075 inch respectively, emanating from and forming uninterrupted slender extensions of one end of the base and densely arranged thereon, each finger having a generally arcuate surface forming the opposing longitudinal edges on adjacent fingers whereby the fingers are free to flex essentially independent of one another.

3,936,625

ELECTROMAGNETIC INDUCTION HEATING APPARATUS

Henry J. Burnett, West Hartford, Conn., assignor to Pollutant Separation, Inc., Elmwood, Conn.

Filed Mar. 25, 1974, Ser. No. 454,675
Int. Cl.² H05B 5/08
U.S. Cl. 219—10.51 5 Claims



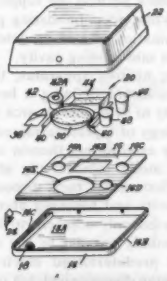
1. An electromagnetic induction heating apparatus comprising a closed tank having side and end walls and including a removable end cover providing a closure for one end thereof, said tank containing a quantity of liquid to be heated, an inlet conduit connected to an inlet opening in said tank and defining a liquid flow path into said tank from a location remote from said tank, an outlet conduit connected to an outlet opening in said tank and defining a liquid flow path out of said tank to a location remote from said tank, a pump connected in series with one of the conduits, at least one electromagnetic induction heater assembly disposed within said tank between said inlet and outlet openings and wholly submerged in the liquid to be heated, said heater assembly including a generally rectangular magnet core having parallel core sections, primary coils wound on said core sections and connected in electrical series, support members attached to opposite ends of said magnet core, a plurality of rods attached to and extending between said support members in spaced relation to said core and in generally parallel relation to said core sections, a spaced apart series of vertically disposed heater plates carried by said rods, said heater plates comprising electrical secondaries in which eddy currents are induced and having openings therein receiving therethrough said core sections and said primary coils wound thereon, said heater plate openings being substantially larger than associated portions of said core sections and said primary coils received therethrough, said rods maintaining said heater plates in spaced relation to each other and in spaced relation to said primary coils and said core sections, means for supporting said heater assembly including mounting brackets attached to said support members at opposite ends of said core, each of said brackets having legs extending outwardly from its associated support member and in the direction of said side wall, a plurality of mounting bosses equal in number to said legs, each of said mounting bosses secured to the inner surface of said side wall and having a slot therein opening in the direction of said one end receiving an outer end portion of an associated leg therein, and fasteners releasably securing said legs to said bosses, and electrical control means responsive to the temperature of the liquid in said tank for energizing said primary coils whereby to induce eddy currents in said heater plates to heat the liquid in said tank and to maintain it at a substantially predetermined temperature.

3,936,626

METHOD OF HEATING COMESTIBLES

Donald G. Moore, Glencoe, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Filed Oct. 25, 1972, Ser. No. 300,763
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 M 5 Claims



1. The method of preparing a meal including a plurality of food items for concurrent equal duration heating in the cavity of a microwave oven under the control of a microwave energy absorbing sensor which exhibits a detectable change in a

characterisitc thereof upon receiving a given quantity of microwave energy, which method comprises the steps of:

selectively shielding at least a portion of said food items with electrically conductive material to provide a generally uniform heating time to bring each item to a condition suitable for consumption,

positioning said food items within the microwave oven and at locations relative to said sensor and to one another so that said food items all receive an amount of microwave energy which is sufficient to heat said food items within the same time interval that said sensor requires to exhibit said detectable change, and

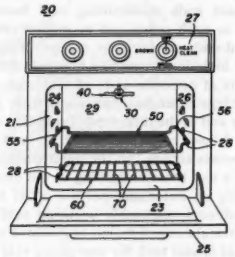
preparing a carrier for detachably holding said food items in said relative positions.

3,936,627

MICROWAVE OVEN WITH SPECIAL RACK DESIGNS

Louis H. Fitzmayer, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 17, 1974, Ser. No. 434,232
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 F **16 Claims**



1. In an electronic heating apparatus, the combination comprising a metal enclosure defining a heating cavity for receiving therein a body to be heated, source means for transmitting microwave energy of a predetermined frequency into said heating cavity for establishing therein a predetermined electromagnetic field mode substantially at said predetermined frequency, and a metal rack disposed horizontally within said heating cavity and having a plurality of spaced-apart rods interconnected only adjacent to the ends thereof and extending substantially parallel to the direction of the electric field of said predetermined electromagnetic field mode, said rack being dimensioned and positioned in said heating cavity for terminating said predetermined electromagnetic field mode substantially at said predetermined frequency, whereby said rack permits the supporting thereon of a body to be heated while accommodating pyro-cleaning of the oven and the termination of said predetermined electromagnetic field mode in said heating cavity.

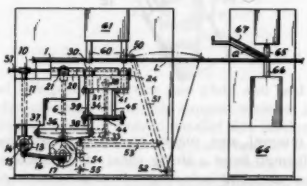
12. In an electronic heating apparatus, the combination comprising a metal enclosure defining a heating cavity for receiving therein a body to be heated, source means for transmitting microwave energy of a predetermined frequency into said heating cavity for establishing therein a predetermined electromagnetic field mode substantially at said predetermined frequency, a first metal rack disposed horizontally within said heating cavity and having a plurality of spaced-apart rods interconnected only adjacent to the ends thereof and extending substantially parallel to the direction of the electric field of said predetermined electromagnetic field mode, said first rack being dimensioned and positioned in said heating cavity for terminating said predetermined electromagnetic field mode substantially at said predetermined frequency, and a second metal rack disposed horizontally within said heating cavity in the wave pattern of said predetermined electromagnetic field mode terminated by said first rack and having a plurality of spaced-apart rods interconnected only adjacent to the ends thereof and extending substantially perpendicular to the direction of the electric field of said predetermined electromagnetic field mode, said second rack being movable among a plurality of different positions within said heating cavity for facilitating optimum heating of associated bodies of different impedances while having no adverse effect on the electromagnetic field pattern in said heating cavity, whereby said racks permit the supporting thereon of bodies to be heated in a plurality of different positions within the heating cavity while accommodating pyro-cleaning of the oven and terminating of said electromagnetic field mode without otherwise interfering with the electromagnetic wave pattern in said heating cavity.

3,936,628

APPARATUS FOR FORMING ELONGATE REINFORCING ELEMENTS

Gerhard Ritter; Josef Ritter; Klaus Ritter; Wilhelm Boyer, and Hans Gott, all of Graz, Austria, assignors to EVG Entwicklungs- u. Verwertungsgesellschaft m.b.H., Graz, Austria

Filed May 2, 1974, Ser. No. 466,482
Claims priority, application Austria, May 3, 1973, 3895/73
Int. Cl.² B23K 11/02
U.S. Cl. 219—56 **9 Claims**



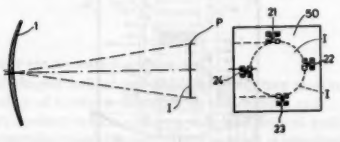
1. Apparatus for manufacturing elongate reinforcing elements consisting of a pair of rods and transverse rungs welded therebetween at right angles to said rods, said apparatus comprising two parallel rod guides spaced apart by substantially the distance required in said finished elements; a transverse rung carrier positioned below the plane of said rod guides, receiving one of said transverse rungs in a direction substantially parallel to said rod guides, and movable to a welding position in which said rung is positioned between, and at right angles to, said rods; a pair of welding electrodes engageable with said rods; and means for drawing said rods through said apparatus.

3,936,629

HORIZON SENSOR FOR A SATELLITE IN GEOSTATIONARY ORBIT

Francois Desvignes, Bourge-la-Reine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,893
Int. Cl.² G01J 1/04
U.S. Cl. 250—209 **7 Claims**



1. A horizon sensor for a satellite in a geostationary orbit, comprising means to project the image of the earth-space transition in a first plane, a reference frame located in said first plane to define a portion of the projected earth-space

transition image relative to a predetermined axis, reflecting means mounted behind said reference frame for reflecting said portion of the transition image and for performing an angular oscillatory movement within the range of a predetermined scanning angle in a second plane perpendicular to said first plane and aligned with said axis, grating means located in said first plane opposite said reflecting means to pass through radiation from the projected earth-space transition image, first and second radiation detecting means located in said first plane to receive, respectively, reflected secondary images from said frame and said grating means during the scanning movement of said reflecting means, and pulse counting means connected to the outputs of said first and second detecting means to indicate, the count of pulses derived from said grating means during a pulse derived from said transition image in said frame.

3,936,630

INTEGRATED SEMICONDUCTOR DEVICE FOR SCANNING AN IMAGE

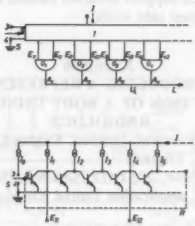
Lothar Blossfeld, Hochdorf, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 24, 1974, Ser. No. 536,053

Claims priority, application Germany, Jan. 30, 1974, 2404237

Int. Cl.² H01L 31/00

U.S. Cl. 250—211 J **8 Claims**



1. An integrated semiconductor device for scanning an image comprising:

a row of photosensitive transistors coupled together as a row of inverters and exposed to the brightness profile of a scanned line, said row comprising a plurality of partial rows;

a common read line;

a plurality of groups of gates, each of said gates having outputs coupled to said common read line and the inputs of each of said plurality of groups coupled to an allotted partial row such that each gate converts a light intensity change via a change in transit speed in the associated partial row to pulse-width changes at said common read line; and

a switch coupled to the first transistor of said row of inverters for triggering the scanning operation.

3,936,631

OPTICAL FIBER POWER TAP

Willis Martin Muska, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

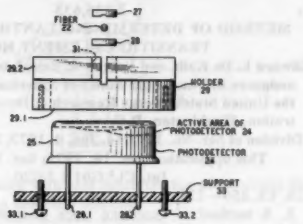
Filed Nov. 11, 1974, Ser. No. 522,518

Int. Cl.² G02B 5/14

U.S. Cl. 250—227 **11 Claims**

1. An arrangement for tapping optical power from an intermediate portion of an optical fiber waveguide without requiring that the fiber be terminated or broken, said fiber including a guiding region in which the optical power is essentially confined, and including a cladding medium surrounding said guiding region, said arrangement being characterized by

a first body of dielectric material having a first major surface disposed in a coupling relationship to an intermediate length of said fiber to couple optical power out of said guiding region of said fiber, said first body having an index of refraction which is approximately equal to or greater than the index of refraction of the medium surrounding said guiding region of said fiber and is selected to couple only a minor portion of the optical power propagating in said fiber waveguide guiding region toward a surface of said dielectric body laterally offset from said guiding region, the material of said first body being substantially more compliant than the material of said fiber;



adjustable means for pressing said fiber against said first body to provide an area of contact between said first surface of said first body and said intermediate length of said fiber, comprising a second body of dielectric material having an index of refraction less than that of said first body; and

a photodetector contacting said laterally offset surface of said dielectric body and including an active area responsive to the wavelength of the optical signal to be propagated through said fiber, said active area of said photodetector being oriented to intercept the optical power coupled out of said guiding region of said fiber by said first body.

3,936,632

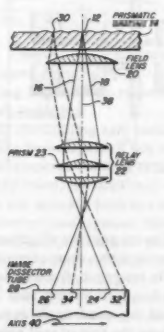
POSITION DETERMINING SYSTEM

William C. Bradley, Chelmsford; Allen H. Greenleaf, Lexington, and Roger K. Lee, Jr., Watertown, all of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 3, 1974, Ser. No. 430,422

Int. Cl.² G01J 1/20

U.S. Cl. 250—237 R **15 Claims**



1. A system for precisely determining the position of a beam of incident radiation and comprising:

a. a prismatic grating means having the beam of radiation incident thereon and having a plurality of spaced prismatic grooves with the prismatic groove upon which the radiation beam is incident refracting the radiation into several separate beams with the relative intensity of each

beam varying according to the precise position of the incident radiation relative to that prismatic groove;

b. means for determining the particular prismatic groove upon which said radiation beam is incident, said determining means including means responsive to the location of at least one of said several separate beams of radiation; and,

c. means for measuring the relative intensities of the separate beams of radiation produced by said prismatic grating means, whereby the precise location of the incident radiation beam relative to the prismatic groove upon which the radiation beam is incident may be determined.

3,936,633

METHOD OF DETERMINING LANTHANIDIES IN A TRANSITION ELEMENT HOST

Edward L. De Kalb, and Velmer A. Fassel, both of Ames, Iowa, assignors to The United States of America as represented by the United States Energy Research & Development Administration, Washington, D.C.

Division of Ser. No. 321,064, Jan. 4, 1973, Pat. No. 893,939. This application Jan. 16, 1975, Ser. No. 541,476

Int. Cl.² G01N *23/20*

U.S. Cl. 250—273 5 Claims

1. A method of detecting trace quantities of fluorescing lanthanides in a transition element alloy comprising:

A. preparing a host composition including yttrium and a transition element;

B. exciting the fluorescing elements within said composition with electromagnetic radiation;

C. spectrometrically analyzing the resulting fluorescent radiation to quantitatively determine trace quantities of lanthanides.

3,936,634

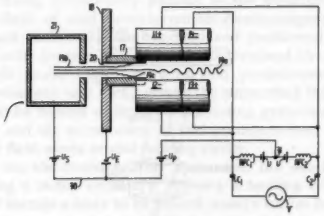
METHOD AND APPARATUS FOR IMPROVED FOCUSING OF ION CURRENTS IN QUADRUPOLE MASS FILTER

Wade L. Fite, Pittsburgh, Pa., assignor to Extranuclear Laboratories Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 346,250, March 30, 1973, Pat. No. 3,867,632. This application Dec. 10, 1974, Ser. No. 531,375

Int. Cl.² H01J *39/34*

U.S. Cl. 250—281 22 Claims



1. In a method of mass analysis which utilizes a quadrupole mass filter and comprises the steps of producing positive ions with an initial kinetic energy E_i from an ion source having an electrical potential U_S, introducing said ions into the space between the poles of the quadrupole mass filter wherein the electric potential along the axis of said poles is U_P, causing the transmission of only those ions of a selected mass-to-charge ratio through the space between said poles, providing a selective shielding at at least one end of said poles which functions substantially as a conductor to the substantially dc fields and substantially as a dielectric to ac fields, said shielding having an electric connection at a potential of U_E, and maintaining said potential U_E less than said potential U_P, and said potential U_P less than said potential of U_S plus E_i/e where e is the charge of the ion.

3,936,635

CORONA GENERATING DEVICE

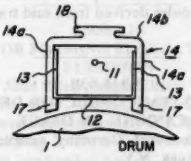
Peter Frederick Clark, Ware, England, assignor to Xerox Corporation, Stamford, Conn.

Filed June 11, 1974, Ser. No. 478,182

Claims priority, application United Kingdom, Dec. 21, 1973, 59526/73

Int. Cl.² H01T *19/00*

U.S. Cl. 250—325 10 Claims



1. A corona generating device comprising a coronode, a metal screen, a shield defined by upturned integral flanges on said screen, and a support member of insulating material, the support member having a channel-shaped cross section, the shield/screen being supported in the channel and retained in the channel-shaped support member behind lips along the free edges of the channel side walls.

3,936,636

METHOD OF PRODUCING A REPRESENTATION OF A PLANAR SECTION OF A BODY USING SCANNING RADIOLOGY

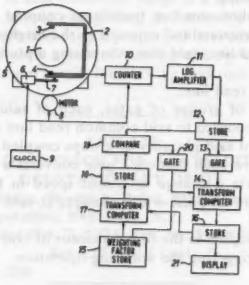
William Spencer Percival, London, England, assignor to EMI Limited, Hayes, England

Filed Mar. 27, 1974, Ser. No. 455,394

Claims priority, application United Kingdom, Apr. 7, 1973, 16783/73

Int. Cl.² G01T *1/16*

U.S. Cl. 250—336 3 Claims



1. A method of producing a representation of the absorption of elements in a planar section of a body in response to an examination of the body with penetrating radiation such as X- or γ- radiation including the steps of:

i. deriving a respective edge value indicative of the absorption suffered by said radiation on traversing each of a plurality of substantially co-planar paths of which at least some intersect, the cross sectional dimensions of each ray being small compared with the dimensions of the body,

ii. performing a transformation process upon said edge values to provide mesh signals indicative of a first estimate of the values of the coefficient of radiation absorption of respective ones of a plurality of elements in a

matrix of elements notionally delineated in said body in the plane of said paths, and

iii. operating upon said mesh signals by:

a. deriving, from said mesh signals, further edge values indicative of the values which respective ones of said first mentioned edge values should assume if the said mesh signals are correct,

b. comparing said first edge values with respective ones of said further edge values to derive edge error signals,

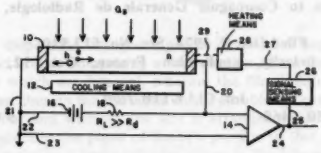
c. transforming said edge error signals to mesh error signals indicative of errors in said mesh signals, and

d. changing said mesh signals in accordance with said mesh error signals.

3,936,637
THERMALLY STIMULATED DETRAPPING OF CHARGED CARRIERS IN CRYOGENIC PHOTOCONDUCTIVE MATERIAL

Marion B. Reine, Wellesley, and Ralph A. Rotolante, Acton, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 13, 1974, Ser. No. 469,266
Int. Cl.² G01D *1/00*
U.S. Cl. 250—352 **13 Claims**



1. In a detector having a photoconductive body, cooling means for maintaining said body at a predetermined quiescent temperature, and output means for receiving a signal from said body upon incidence of signal producing radiation, the improvement comprising:

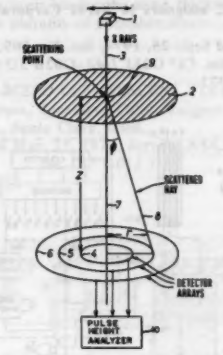
heating means responsive to said output means for heating said body to a temperature and for a time sufficient to accelerate decay of said radiation produced signal.

3,936,638
RADIOLOGY

David John Gibbons, Ickenham, England, assignor to EMI Limited, Hayes, England

Filed June 26, 1974, Ser. No. 483,451
Claims priority, application United Kingdom, July 6, 1973, 32422/73
Int. Cl.² G01N *23/00*; G01T *1/22*
U.S. Cl. 250—358 R **3 Claims**

1. Apparatus for examining a body by means of radiation such as X- or γ- radiation, including a source of a beam of radiation of energy in the range 0.2 to 2.0 MeV, means for directing said radiation into said body, a detecting arrangement disposed on the opposite side of said body to said source, the detecting arrangement comprising a plurality of arrays of detectors, arranged in circles concentric about the said beam,

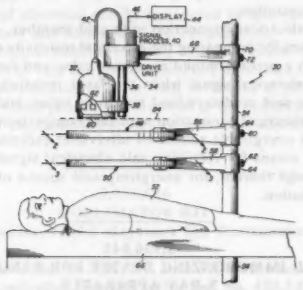


and means associated with said detectors for determining the energy of radiation detected thereby.

3,936,639
RADIOGRAPHIC IMAGING SYSTEM FOR HIGH ENERGY RADIATION

Harrison H. Barrett, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 1, 1974, Ser. No. 465,940
Int. Cl.² G01T *1/166*
U.S. Cl. 250—369 **39 Claims**



1. An imaging system comprising:

means for detecting high energy radiation emanating from a source of such radiation;

means for spatially modulating said radiation, said modulating means having regions which are relatively opaque to said radiation interspersed among regions relatively transparent to said radiation, the depths of said opaque regions being less than the spacing between said opaque regions to permit shadows of said opaque regions cast by rays of radiation emanating from one part of said source to overlap a shadow of said opaque regions cast by rays of radiation emanating from a second part of said source spaced apart from said first part of said source, said modulating means being positioned between said source and said detecting means;

means for imparting a relative motion between said detecting means and said modulating means, said detecting means including means for providing an array of data points having data relative to an image of the shadows cast by said modulating means; and

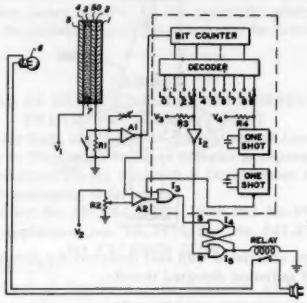
means coupled to said detecting means for reconstructing from said array of data points a true image of said source.

3,936,640

IMAGING SYSTEM

Werner E. L. Haas, Webster, and Joseph F. Stephany, Sodus, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1974, Ser. No. 509,210
Int. Cl.[2] G01J 1/42; G02B 5/23
U.S. Cl. 250—372 11 Claims



1. An electro-optic device, comprising:

a. an electro-optic member comprising between two electrodes a layer of pure liquid crystalline composition comprising a pure trans-stilbene nematic liquid crystalline material;

b. an electrically energizable source of ultraviolet radiation positioned to impinge said layer with radiation upon energization;

c. in electrical connection with said member, comparison means for comparing the electrical resistivity of said layer with a predetermined resistivity value and for generating an electrical signal when the layer resistivity is greater than said predetermined resistivity value; and

d. in electrical connection with said comparison means and said energizable source of ultraviolet radiation, energizing means for receiving said electrical signal and, upon receipt thereof, for energizing said source of ultraviolet radiation.

3,936,641

HEAD IMMOBILIZING DEVICE FOR PANORAMIC X-RAY APPARATUS

Karl Heimur, Newdorp, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 21, 1974, Ser. No. 516,344
Int. Cl.[2] G03B 41/16
U.S. Cl. 250—439 10 Claims

1. In a human head immobilizing device for panoramic x-ray apparatus, the combination of

a. a pair of horizontally spaced, upright arms movable in horizontal directions, adapted to contact the sides of a patient's head,

b. a chin rest disposed between the lower portions of said arms, adapted to receive a patient's chin thereon,

c. a housing rigidly supporting said chin rest and also movably supporting said arms,

d. an elongated, upright bar carrying said housing and depending downwardly therefrom, and

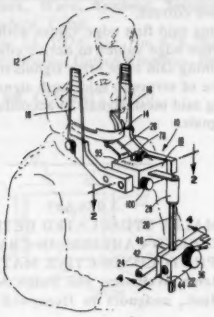
e. improved supporting means engaging a lower portion of said bar and providing vertically adjustable support therefor, said supporting means including

f. a gear box,

g. a toothed rack extending longitudinally on one side of said upright bar and being slidable through said box in generally vertical direction with said upright bar,

h. a pinion rotatable within said gear box engaging said toothed rack to move it in opposite vertical directions,

i. knob means outside said gear box and connected to said pinion for manually rotating said pinion, whereby the elevation of said chin rest and said arms is adjustable, and



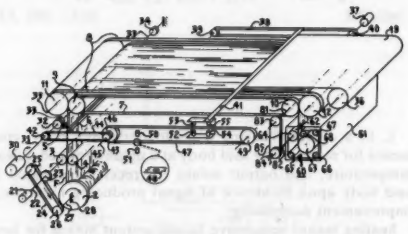
j. a vise operatively associated with said gear box for securing said upright bar in selected vertical positions, comprising first and second movable jaws and a screw cooperatively threaded to said jaws.

3,936,642

X-RAY FILM-HANDLING ARRANGEMENT FOR X-RAY DIAGNOSTIC APPARATUS

Pierre Lajus, and Edmond Chambron, both of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Oct. 9, 1974, Ser. No. 513,510
Claims priority, application France, Oct. 12, 1973, 73.36608
Int. Cl.[2] G11B 1/00
U.S. Cl. 250—469 5 Claims



1. An X-ray film-handling arrangement using roll-film, comprising: means for supplying film from a roll including a first pair of contiguous feeding rollers driven by a first motor; means for transferring the film including two pairs of flat superposed and contiguous conveyor belts respectively stretched on a second and a third pair of transfer rollers driven by a second motor, the two pairs of belts being so arranged as to grip the lateral edges of the film, said second motor having a shaft coupled, by means of a clutch to one of said second pair of transfer rollers whose shaft being provided with a brake; means for cutting said film including a pair of blades arranged between said supplying means and said transferring means to cut the film when it has been transferred to its the exposure position; and a movable member including a leaded mask displaceable by means of a third motor for limiting the length of the film format being irradiated to any length whatsoever between predetermined maximum and minimum lengths; and means for reproducing the displacement of the

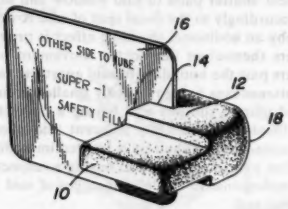
film including an indexing belt held in parallel with the conveyor belts on a pair of pulleys respectively located beyond the extreme positions of the said movable member, one of said pulleys being coupled to the shaft of said second motor so that a random point on the indexing belt can be moved for a distance identical to the length of film which is transferred by said conveyor belts, said indexing belt being provided with a marker for co-operating with at least one detection device secured to the end of said movable member, said detection device delivering a first electrical control signal, when the said marker passes adjacent thereto, transmitted to the said clutch and/or brake for controlling the displacements of said conveyor belts, to stop said latter when the end of the film reaches that of the movable member.

3,936,643

X-RAY DENTAL FILM HOLDER

Anthony S. Toner, Walnut Creek, Calif., assignor to Sterling Drug Inc., New York City, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,758
Int. Cl.² G03B 41/18
U.S. Cl. 250—478 1 Claim



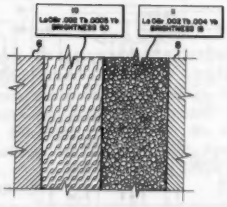
1. A disposable one piece plastic holder for dental X-ray film said holder comprising a bite portion and a film holding portion which are integral, wherein the film-holding portion has a slot therein for frictional but separable reception of the X-ray film and wherein the slot is arranged perpendicularly with respect to the plane of the bite portion so that the film is held likewise in a perpendicular plane to the bite portion.

3,936,644

MULTI-LAYER X-RAY SCREENS

Jacob G. Rabatin, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,102
Int. Cl.² G01J 1/58; G01N 21/52
U.S. Cl. 250—486 7 Claims



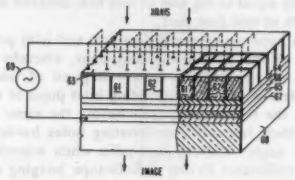
1. An x-ray intensifying screen for reducing radiographic quantum mottle comprising a photographic film and a plurality of contiguous phosphor layers being disposed with respect to said film so that the phosphor layers are of different chemical compositions wherein one of said phosphor compositions is a terbium activated rare-earth oxyhalide phosphor to provide increasing luminous efficiency under x-ray excitation from the phosphor layer nearest the film to the outermost layer, and each of said layers being of such predetermined thickness such that total x-ray absorption and brightness for the plurality of phosphor layers is approximately equal to a single phosphor layer having the same thickness as the total thickness of the plurality of phosphor layers.

3,936,645

CELLULARIZED LUMINESCENT STRUCTURES

Arthur H. Iversen, Saratoga, Calif., assignor to Radiologic Sciences, Inc., Santa Clara, Calif.

Filed Mar. 25, 1974, Ser. No. 454,383
Int. Cl.² G01J 1/58
U.S. Cl. 250—486 2 Claims



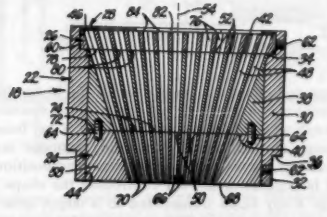
1. A structure for responding to X-ray radiation, comprising
a cellularized member of luminescent material which emits light in response to X-ray radiation, said member comprising a plurality of volumes of said luminescent material separated by wall members,
a photoconductive layer disposed on one surface of said cellularized member to be exposed to X-rays,
an electroluminescent layer disposed on the opposite side of said cellularized member from said photoconductive layer, and
a source of electrical energy connected to said photoconductor and said electroluminescent material,
said luminescent material emitting light in response to X-ray radiation to vary the photoconductive effect exhibited by said photoconductive layer, said variations in photoconductive effect producing variations in the potential across and the electroluminescence of said electroluminescent layer.

3,936,646

COLLIMATOR KIT

Roelof R. Jonker, 15912 Maybrook St., Westminster, Calif. 92683

Continuation of Ser. No. 268,135, June 30, 1972, abandoned.
This application Nov. 29, 1973, Ser. No. 420,137
Int. Cl.² H01J 35/16
U.S. Cl. 250—509 11 Claims



1. A collimator kit for providing focusing collimators having different performance characteristics, for radioisotope imaging apparatus comprising:
first and seconnd collimator parts each having a central longitudinal axis, inlet and exit end faces normal to said axis, and tapered collimating holes opening at their small

ends through said inlet face to provide an array of inlet pupils and at their large ends through said exit face to form an array of exit pupils,

said parts being adapted to be assembled in coaxial end to end relation with said exit face of said first part and said inlet face of said second part in face to face contact,

said collimating holes of said first part having longitudinal axes which intersect the longitudinal axis of the latter part substantially at a common point located a first distance beyond the inlet face of said first part,

said collimating holes of said second part having longitudinal axes which intersect the longitudinal axis of the latter part substantially at a common point located beyond the inlet face of said second part a second distance approximately equal to the sum of said first distance and the axial length of said first part,

the exit pupil array of said first part and inlet pupil array of said second part being congruent, whereby when said parts are assembled, each exit pupil of said first part registers with a corresponding inlet pupil of said second part, the registering pupils having the same dimensions and their respective collimating holes having the same taper angle, whereby said parts when assembled form a first collimator having radioisotope imaging characteristics, and

one of said parts being a basic collimator part which by itself forms a second collimator having different performance characteristics than said first collimator.

3,936,647

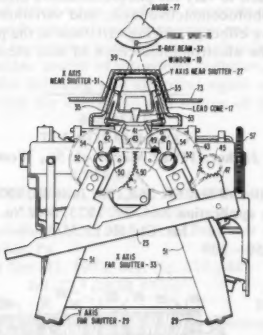
X-RAY COLLIMATOR FOR CONTROLLING THE EMISSION OF SECONDARY RADIATION

Nicholas M. G. Fekete, Ellicott City, Md., assignor to CGR Medical Corporation, Baltimore, Md.

Continuation of Ser. No. 357,241, May 4, 1973, abandoned. This application July 29, 1974, Ser. No. 492,842

Int. Cl.[2] G21F 5/04

U.S. Cl. 250—512 11 Claims


ANODE - 77
FOCAL SPOT - 75
X-RAY BEAM - 37
WINDOW - 39
Y AXIS NEAR SHUTTER - 27
X AXIS NEAR SHUTTER - 31
LEAD CONE - 17
X AXIS FAR SHUTTER - 33
Y AXIS FAR SHUTTER - 29

1. X-ray collimator apparatus comprising in combination:

a collimator housing having a central axial opening therethrough adapted for the passage of an X-ray beam therethrough and additionally including actuator means for selectively controlling the movement and position of near and far shutter means for controlling the shape and size of an X-ray beam transmitted to a target area from an X-ray generator, said X-ray generator having a window of predetermined shape for the passage of said X-ray beam therethrough;

an outwardly projecting lead cone type shield member impervious to X-rays located between the near shutter means and the focal spot of said X-ray generator, said shield member including an aperture in substantial alignment with said X-ray beam adjacent said window, the size of said aperture defining the maximum size of the X-ray beam permitted to enter and pass through said collimator housing, said shield member being further adapted to envelop as well as protect the near shutter means, being attached to the top of said collimator housing over said opening and having a shape substantially conforming to the shape of said window thereby confining secondary or off-focus radiation emitted from said X-ray generator and permitted to enter said collimator housing entirely to said aperture;

a first and second pair of adjustable near shutters, comprising said near shutter means, coupled to said actuator means and comprising blade shutter elements for respective orthogonal axes, both pairs of near shutters being located entirely within said shield member adjacent said aperture and being adapted for mutually independent non-obstructed movement therein for not only defining the desired shape and size of the X-ray beam by movement past the boundary of said aperture into the open space provided thereby to intersect the X-ray beam, but also more effectively confining and restricting said secondary radiation present at said aperture, said confining being accomplished by the relatively closer positioning of said near shutter pairs to said window and said aperture and accordingly to the focal spot of said X-ray generator whereby an additional shielding effect is provided by the shutters themselves due to the movement of said near shutters past the boundary of said aperture, said first pair of shutter means being relatively smaller in size than said second pair of shutters and having a respective leading edge located immediately adjacent said aperture while said second pair of shutters is located immediately below said first pair of shutters and having a respective leading edge orthogonal to the leading edges of said first pair of shutters; and

means coupled to said actuator means for selectively providing manual and motor driven operation of said shutters.

3,936,648

FLAME MONITORING APPARATUS

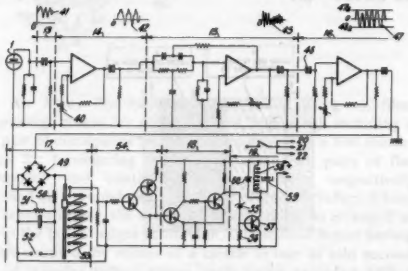
Pierre J. B. Cormault, Fourqueux, and Jean M. Megnoux, Poissy, both of France, assignors to Electricite de France, Paris, France

Filed Mar. 18, 1974, Ser. No. 452,449

Claims priority, application France, Mar. 20, 1973, 73.09936; Mar. 8, 1974, 74.07933

Int. Cl.[2] G01N 21/58

U.S. Cl. 250—554 11 Claims



8. Flame monitoring apparatus comprising:

wide frequency band photo-electric pick-up means, capacitive coupling means having its input connected to the output of said pick-up means,

first amplifying means having its input connected to the output of the capacitive coupling means,

high-pass filter means having a cut-off frequency of about 50Hz having its input connected to the output of said first amplifying means,

second amplifying means adapted to saturate and having its input connected to the output of said high-pass filter means,

detector integrator means having its input connected to the output of said second amplifying means,

trigger means having its input connected to the output of said detector integrator means, and output circuit means having its input connected to the output of said trigger means and adapted to provide an output signal if the flame being monitored is extinguished.

3,936,649

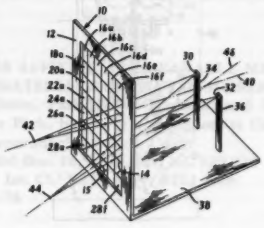
METHOD AND APPARATUS FOR USE IN POSITION DETERMINING

Paul L. Di Matteo, 6 Carol Court, Dix Hills, N.Y. 11746; Joseph A. Ross, 26 Trescott Path, Fort Salonga, N.Y. 11768, and Howard K. Stern, 89 Derby Ave., Greenlawn, N.Y. 11740

Filed July 22, 1974, Ser. No. 490,875

Int. Cl.² G01C *11/12*

U.S. Cl. 250—558 **16 Claims**



1. Apparatus for generating signals for use in determining the positional coordinates of a given location having unknown positional coordinates comprising:

a. reticle means for defining a plurality of separately discernible cells, each cell defining a predetermined distinct extent of a field of view extending from said given location to said reticle means;

b. means for defining a discernible indicium;

c. means for spacedly positioning said reticle means and said indicium defining means in said field of view; and

d. means for generating a signal indicative of the one of said cells defining the extent of said field of view inclusive of the line optical path extending from said given location to said indicium.

3,936,650

DIRECTION OF MOVEMENT SENSING DEVICE FOR A PERFORATED CODE CARRIER TAPE

Sven Gunnar Valter Stenudd, Lidingo, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

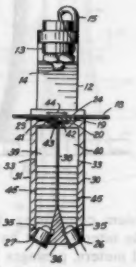
Filed Apr. 1, 1974, Ser. No. 456,820

Claims priority, application Sweden, Apr. 2, 1973, 7304585

Int. Cl.² G01N *21/30*

U.S. Cl. 250—571 **3 Claims**

1. A device for sensing the direction of movement of a perforated code carrier tape comprising a light source positioned on one side of said tape, at least one elongated enclosed channel, a longitudinally extending partition dividing said channel into two longitudinal sections, at least one pair of photosensitive members located at the other side of said tape and at a distance therefrom at one end of said channel, one photosensitive member of said pair being located in one longitudinal section while the other photosensitive member is located in the other longitudinal section, means upon movement of said tape in a predetermined direction for dividing the light emitted from said light source and passing the light through one part of a hole in said code carrier tape and through one of said divided longitudinal sections of said channel for directing said light to one of said pair of photosensitive members, said light passing through another part of said hole and through the other divided longitudinal section of said channel for directing said light to the other photosensitive member



upon the continued movement of the tape in said predetermined direction, the end of said channel adjacent to said code carrier tape being provided with an opening of reduced dimensions, the size of which corresponds to the size of the hole in said code carrier tape, said partition having a tab projecting into said opening which is integral with said partition to thereby divide said opening into two portions of substantially the same size.

3,936,651

TURBOSET INCLUDING A HELIUM TURBINE AND A HELIUM-COOLED GENERATOR

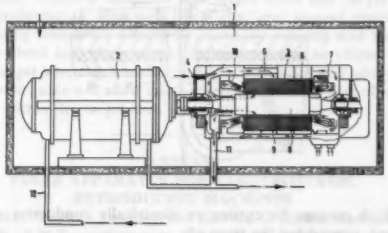
Arnold Abolins, Mulheim (Ruhr); Hermann Finckh, Boxdorf; Dietrich Lambrecht, Mulheim (Ruhr), and Martin Trabler, Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Jan. 15, 1974, Ser. No. 433,520

Claims priority, application Germany, Jan. 18, 1973, 2302456

Int. Cl. H02p *9/04*

U.S. Cl. 290—1 R **7 Claims**



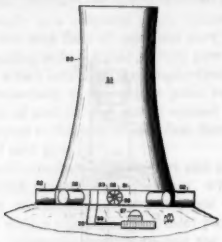
1. Turboset comprising an engine room filled with helium, a helium turbine mounted in said engine room, and a generator connected to said helium turbine in said engine room, said generator having means defining at least one opening exposing the interior thereof to the helium in said engine room so as to be cooled thereby, and means connecting the interior of said generator to a supply of helium outside said engine room having a helium pressure lower than the helium pressure in said engine room.

3,936,652

POWER SYSTEM

Steven K. Levine, 713 Washington St., New York, N.Y. 10014

Filed Mar. 18, 1974, Ser. No. 451,755
Int. Cl.² F03D 9/00
U.S. Cl. 290—2 1 Claim



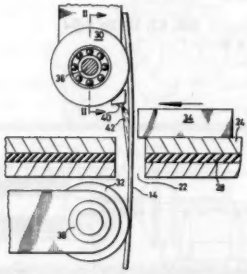
1. A power system comprising, in combination, a tower containing a single interior duct having a vertical rise of at least one hundred meters, passages leading to the bottom of the duct, insulation lining said duct, heating coils mounted on the inner side of said insulation, said heating coils heating air to rise in said duct and draw additional air in through said passages, an atomic reactor, a working fluid circulating between said atomic reactor and said heating coils, generators, and rotatably mounted vanes disposed in said passages driven by air passing through said duct and said passages, said vanes driving said generators providing power.

3,936,653

PROCESS AND DEVICE FOR CUTTING ELECTRICALLY CONDUCTIVE MATERIAL WORKPIECES

Hans Gunter Bals, Blumgesgrundstrasse 44, Geinhausen-Hailer, Germany

Filed Mar. 25, 1974, Ser. No. 454,703
Claims priority, application Germany, Mar. 27, 1973, 2315095
Int. Cl.² B23P 1/12
U.S. Cl. 219—68 18 Claims



1. A process for cutting an electrically conductive workpiece, comprising the steps of:

establishing relative movement in a cutting direction between the workpiece and a circulating endless electrode,

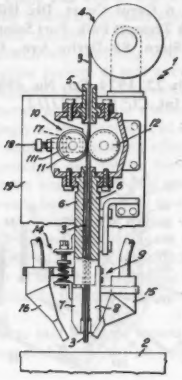
and cyclically moving the electrode and the workpiece into and out of contact with each other at a cutting place on the workpiece, during at least a portion of each cycle applying between the electrode and the workpiece an electrical voltage strong enough to produce an arc therebetween which heats the workpiece to soften and melt the material thereof, and during a portion of said cycle as the workpiece and the element are moved into contact with each other, mechanically removing both softened and melted workpiece material by movement of the circulating electrode through the cutting place.

3,936,654

PROCESS AND APPARATUS FOR THE PERFORMANCE OF ARC WELDING AND OVERLAYING, PREFERABLY SUBMERGED ARC

Ugo Cannata, Genoa, Italy, assignor to La Soudure Electrique Autogene, Procedes Arcos, Belgium

Filed Apr. 5, 1974, Ser. No. 458,230
Claims priority, application Italy, Feb. 21, 1974, 12611/73
Int. Cl.² B23K 9/18
U.S. Cl. 219—73 2 Claims



1. An electric welding or overlaying process by submerged arc which comprises unwinding filler material strip from a roll, feeding the strip between jaws of a vise which pulls the strip forward and supplies electric current, maintaining an arc between the strip and the work, submerging the arc beneath a flux and continuously deforming the strip laterally to produce undulations along the strip by rolls with knurled ribs in contact with the concave surfaces of the resulting undulations and by smooth rolls opposite the corresponding convex surfaces, so as to produce compulsory contact between the strip and the slide jaws and preferred electrical current paths between the strip and the work to provide smooth arcing across the strip.

3,936,655

MAGNETIC FEEDING OF POWDER IN SUBMERGED ARC WELDING

Roman F. Arnoldy, P.O. Box 19527, Houston, Tex. 77024

Filed Sept. 26, 1974, Ser. No. 509,427
Int. Cl.² B23K 9/18
U.S. Cl. 219—73 11 Claims

5. A feeder for use in welding in a weld zone including,

a discharge nozzle formed of an electrically non-conductive material,

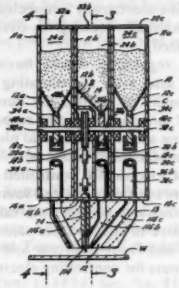
means for feeding an electrically conductive consummable electrode through the nozzle to the weld zone,

means for feeding particles of magnetically-responsive weld material to the electrode,

means for feeding fluxing material to the weld zone, and

means for causing an electric current to flow in the electrode thereby providing a magnetic field about the electrode,

whereby the particles of magnetically-responsive weld materials fed to the electrode magnetically adhere to it and



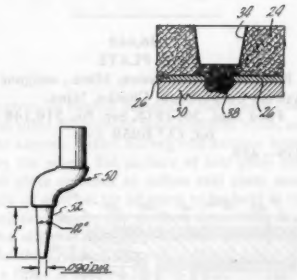
are pulled down by it through the fluxing material to the weld zone as the electrode is fed to the weld zone.

3,936,656

METHOD OF AFFIXING AN ABRADABLE METALLIC FIBER MATERIAL TO A METAL SUBSTRATE

Robert Middleton, Palm Beach Gardens, and William E. Smith, Lake Park, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1974, Ser. No. 533,410
Int. Cl.² B23K 9/04; B21J 1/06
U.S. Cl. 219—76 7 Claims



1. A method for fixing an abradable material formed of metallic particles randomly affixed to each other and sintered to a specified thickness and density to a metal substrate comprising the steps of:

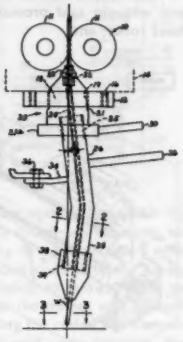
1. fixing the abradable material to a metal backing plate;
2. placing the abradable material and backing plate so that the backing plate will engage a surface of a metal substrate;
3. compressing the abradable material to substantially a solid mass at spaced locations;
4. heating the compressed spaced locations of abradable material by electrical resistance to a sintering temperature and pressing the spots to form a solid mass;
5. heating the solid mass of locations of abradable material to an increased temperature by electrical resistance, welding the solid mass of abradable material to the substrate completely penetrating the backing plate.

3,936,657

UNIVERSAL POSITIONING WELDING TORCH

Willis G. Groth, Creve Coeur, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed July 5, 1974, Ser. No. 486,155
Int. Cl.² B23K 9/00
U.S. Cl. 219—136 14 Claims



1. Apparatus for welding comprising: means for feeding weld wire in a general direction toward a target work piece having a target area thereon, the weld wire passing through a welding assembly and through an adapter attachment portion having an adapter attachment opening therein; an adapter fitted into said adapter attachment opening, said adapter having a first adapter opening which is generally circular and of smaller diameter than said attachment opening; said first adapter opening defining a weld wire axis generally perpendicular to said target; said adapter having a second adapter opening at a skew angle to said weld wire axis to define a skew axis; said second adapter opening being in communication with said first adapter opening; said adapter having a third adapter opening also at a skew angle to said weld wire axis having a greater diameter than said second opening and in communication with said second opening; a weld guide fitted into said third adapter opening along said skew axis; said weld guide being bent at a portion external from said third adapter opening so as to intersect said weld wire axis; weld wire adapted to pass through said first, second and third adapter openings during welding; first manual operating means for selectively manually rotating said adapter about said weld wire axis to generally define a circle on said target when said target is perpendicular to said weld wire axis; and second manual operating means for selectively manually rotating said weld guide about said skew axis to define generally an ellipse on said target whereby selective manual rotation of said adapter and weld guide will allow intersection by said weld wire of any point within the target area.

3,936,658

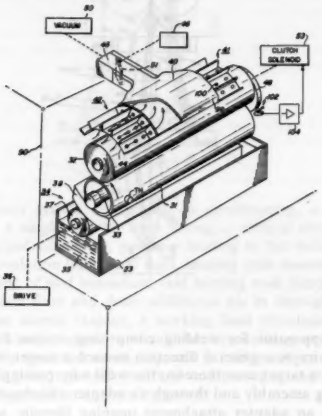
FUSER APPARATUS FOR ELECTROSTATIC REPRODUCING MACHINES

Robert L. Traister, Fairport, and Edward G. Reehil, Henrietta, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1974, Ser. No. 445,012
Int. Cl.² H05B 1/00
U.S. Cl. 219—216 4 Claims

1. In an electrostatic reproducing machine wherein latent electrostatic images are formed and developed with toner particles deposited on photo-conductor means, said developed images transferred to copy sheets, an improved fusing apparatus for fusing said toner particles to said copy sheets comprising:

a fuser roller;
means for heating said fuser roller;
a pressure roller;
means for driving said pressure roller into a first position in response to a first control signal wherein said pressure roller is urged against said fuser roller at a predetermined pressure level, said drive means moving said pressure roller into a second position in response to a second control signal wherein said pressure roller is removed from said fuser roller; and

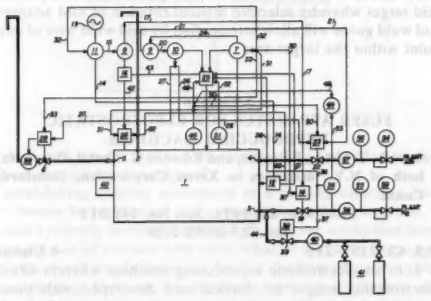


means for controlling said drive means, said control means applying said first control signal to said drive means when machine condition signals indicate a start of a copying operation, said control means applying said second control signal to said drive means in response to signals indicating completion of said copy operation, said control means applying said second control signal to said drive means in response to machine condition signals indicating a copy operation malfunction.

3,936,659
ELECTRICALLY HEATED OVEN FOR HIGH TEMPERATURE CLEANING

Kenneth R. Mainord, 522 N. First, Apt. 105, Longview, Tex. 75601

Filed May 31, 1974, Ser. No. 474,916
Int. Cl.² H05B 1/02
U.S. Cl. 219—413 **8 Claims**



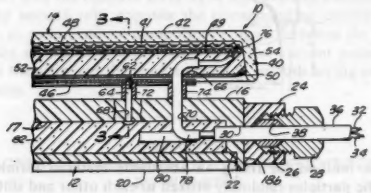
1. In an electrically heated, high temperature cleaning oven in which organic contaminants are pyrolyzed and the resulting residues are oxidized, the combination which comprises:

a. a plurality of timers to automatically direct a cleaning operation;
b. a start button connected to a power source to initialize one of said plurality of timers to direct the purging of said oven with inert gas;
c. interlock means electrically connected to said start button for automatically locking an oven door when said oven is energized;
d. temperature regulating means having a temperature probe within said oven for initiating a second of said plurality of timers to control the duration of pyrolysis, with a third of said plurality being responsive to an end of cycle pulse from said second of said plurality to direct the oxidation of contaminant residues;
e. a plurality of electrically controlled pneumatic valves interposed between said oven and sources of air and inert gas, and responsive to signals from said timers;
f. means responsive to signals from said temperature regulating means and from said one and said third of said plurality of timers for controlling electrical heaters within said oven;
g. automatic correcting means having a high temperature gas detector probe within said oven and electrically connected to said heater control means, to one of said plurality of valves controlling the flow of air from a pressurized air source into said oven, and to an alarm for signaling the presence of combustible gas and taking corrective action;
h. pressure sensing means connected between said oven and an inert gas source for signaling failure of said gas source;
i. means connected between said oven and said sources of pressurized air and inert gas for maintaining a preset air and inert gas mixture when air is admitted into said oven;
j. temperature control means having a temperature probe within said oven for deenergizing said heater control means in event of overheating or rapid temperature changes; and
k. means forming a caged panel within a wall of said oven to relieve pressure while retaining debris in event gases within said oven ignite.

3,936,660
HOT PLATE

Robert S. Blackwood, Chanhassen, Minn., assignor to Fluoroware Systems Corporation, Chaska, Minn.

Filed Sept. 30, 1974, Ser. No. 510,148
Int. Cl.² H05B 3/68
U.S. Cl. 219—459 **3 Claims**



1. A hot plate comprising in combination a top portion having a top ceramic deck defining a heated working surface, the deck also having down-turned edges defining a peripherally continuous depending wall, there being a heater compartment beneath the deck and within the depending wall; a heating element operably disposed in said heater compartment below said working surface and having electrical terminals; circuit means for supplying electrical energy from a power source to said terminals; a base portion for operably supporting said top portion in thermal isolation therefrom; and means including epoxy foam beneath the heating element and extending across and substantially filling the heater compartment, the epoxy foam providing a seal to the depending wall and cooperating with the deck and depending peripheral wall

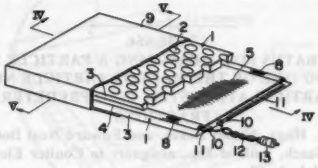
for encapsulating said heating element and said circuit means to confine substantially all of the heat generated to said working surface, said base portion being constructed of fluorocarbon materials as a separate structure and attached to said top portion in spaced apart configuration to further provide additional thermal isolation between said heated working surface and said base portion, said circuit means extending through said base portion for protection from heat and hostile environments.

3,936,661

ELECTROTHERMALLY DEFORMABLE LEVELLING PAD

Haruhisa Furuishi; Suita; Yoshihiro Murata, Katano; Hidenori Suzaki, Hirakata; Misao Sumoto, and Hiroshi Imanaka, both of Otsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Toyo Boseki Kabushiki Kaisha, both of, Japan

Filed Oct. 1, 1974, Ser. No. 511,472
Claims priority, application Japan, Oct. 1, 1973, 48-110852
Int. Cl.² H05B *3/34*
U.S. Cl. 219—528 **6 Claims**



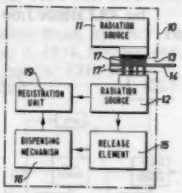
1. An electrically heated alignment pad which comprises at least one flat plate member of thermoplastic resin, and at least one thin flat electric heater having one surface laying against substantially the whole flat surface of said plate member for heating said plate member to soften said plate member, the other surface of said heater adapted to be held in electrically insulated relationship to the surface supporting it and to an article to the aligned, said plate member and heater having a structure the thickness of which is reduced when an external compressive force is applied thereto when said plate member is in the heat softened condition, whereby an object through which the compressive force is applied can be moved by the reduction of thickness of the alignment pad for adjusting the position thereof in the direction of the force being applied to the alignment pad; said plate member having a plurality of apertures therein into which portions of said plate member around said apertures flow laterally upon the softening of said plate member when said compressive force is applied thereto and to be filled up with melted portion of the thermoplastic resin when the latter is heated; said thermoplastic resin being a random copolymerized polyester which comprises an acid component, which contains an aromatic carboxylic acid and an aliphatic dicarboxylic acid having not less than 6 carbon atoms, the mole ratio of the aromatic carboxylic acid residue relative to the aliphatic dicarboxylic acid residue relative to the aliphatic dicarboxylic acid residue in said copolymer being within the range of 40/60 to 95/5, and a glycol component which is at least one compound selected from the group consisting of an aliphatic diol, an aromatic diol and an alicyclic diol.

3,936,662

INTERLOCKING SYSTEM WITH A NUMBER OF INDIVIDUAL KEY ELEMENTS

Anders Ruben Rausing, Via Kenia 22-24, Rome, Italy (I)

Filed Jan. 14, 1974, Ser. No. 433,373
Int. Cl. G06k *19/06, 7/10*
U.S. Cl. 235—61.12 N **1 Claim**



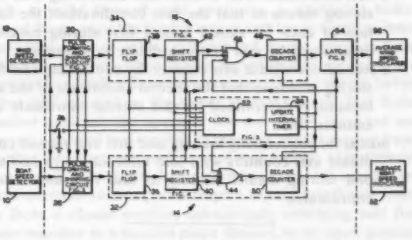
1. In an interlocking system actuatable by any one of a plurality of differently coded key elements, said system comprising an interlocking device including a radio-active source of radiation, a radiation code detector having its input side located in spaced relation to said radiation source, a release element connected to the output side of said code detector and means for receiving the coded key elements between said radiation source and said code detector, the improvement wherein each said coded key element comprises a sheet of plastic material, the portions of said sheet opaque to the radiation being established by a coating of a chemical compound incorporating a heavy metal and the portions of said sheet transparent to the radiation and representing the code pattern being established by a different coating but which has a visual appearance similar to that of the opaque coating so that the sheet of plastic material appears homogeneous throughout its surface and thereby in effect makes the code pattern invisible.

3,936,663

SIGNAL AVERAGING CIRCUIT

Lucian W. Taylor, Los Altos, and John M. Yarborough, Jr., Palo Alto, both of Calif., assignors to Velcon Filters, Inc., San Jose, Calif.

Division of Ser. No. 376,709, July 5, 1973, Pat. No. 3,881,094.
This application Sept. 12, 1974, Ser. No. 500,964
Int. Cl.² G06F *15/20;* **G01P** *3/52*
U.S. Cl. 235—150.51 **17 Claims**



1. A circuit for producing an output signal representing a running average of a continuous input signal comprising:

an input for said continuous input signal;

a pulse forming and shaping means responsive to said continuous input signal for producing a train of output pulses;

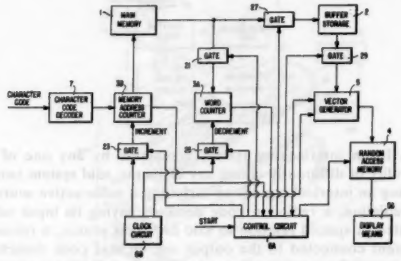
a pulse accumulating means responsive to said output pulse train for accumulating a predetermined number of pulses representing said running average output signal whereby the most recent pulse replaces the oldest pulse in said pulse accumulating means; and

a clock means for controlling said pulse forming and shaping means and said pulse accumulating means.

3,936,664
METHOD AND APPARATUS FOR GENERATING CHARACTER PATTERNS

Hiroshi Sato, Tokyo, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sept. 24, 1974, Ser. No. 508,850
Claims priority, application Japan, Sept. 25, 1973, 48-106946
Int. Cl.² H04N 3/00
U.S. Cl. 235—151 6 Claims



1. Apparatus for generating a character pattern comprising

vector producing means for sequentially producing a plurality of vectors comprising said character pattern;

first storing means for storing said vectors where the configuration of said vectors in said first storing means corresponds to the configuration of said character pattern so that display or recording thereof is readily effected;

said vector producing means including

second storing means for storing vector control words containing information about each of said vectors; and

processing means for sequentially processing said vector control words to produce said plurality of vectors;

said first storing means having said vectors stored therein in accordance with a predetermined coordinate system and where the vector control words stored by said second storing means includes information on the coordinates of the starting point of each vector in said predetermined coordinate system, (b) the length of each vector and (c) the direction thereof; and

said first storing means including a plurality of locations for storing bits of information and said processing means including

a first coordinate axis counter for controlling said first storing means so that the first coordinate of the location of each bit stored in said first storing means is determined by said first coordinate axis counter,

a second coordinate axis counter for controlling said first storing means so that the second coordinate of the said location is determined by said second coordinate axis counter; and

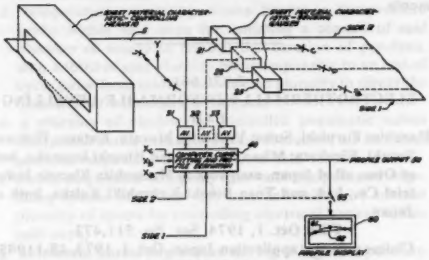
means for sequentially loading said first and second coordinate axis counters with said information in said second storing means relating to said first and second coordinates.

3,936,665
SHEET MATERIAL CHARACTERISTIC MEASURING, MONITORING AND CONTROLLING METHOD AND APPARATUS USING DATA PROFILE GENERATED AND EVALUATED BY COMPUTER MEANS

John Francis Donoghue, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Continuation of Ser. No. 261,998, June 12, 1972, abandoned.
This application Apr. 29, 1974, Ser. No. 464,947
Int. Cl.² G05B 15/02; G06F 15/46
U.S. Cl. 235—151.3 26 Claims

1. A method of controlling a machine direction characteristic of a sheet comprising measuring a property of a sheet related to the characteristic at a plurality of locations across the sheet to derive an indication of the property at each of a plurality of discrete, spaced cross sheet points, responding to the indications and a predetermined mathematical expression relating values of the property to cross direction location to derive a signal representing a continuous, analytic equation that approximates the values of the property as a function of

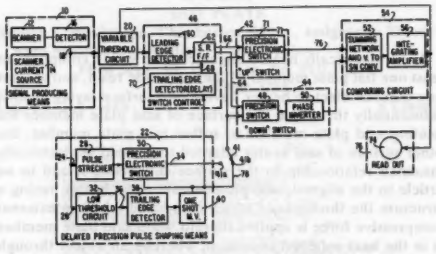


cross direction location substantially across the entire sheet width, deriving a machine direction control indication by integrating the signal representing the equation over a cross direction interval of the sheet that is substantially across the entire sheet width, and controlling the characteristic uniformly across the sheet width in response to the control indication.

3,936,666
APPARATUS FOR MEASURING A PARTICLE SIZE DIVIDING ONE OF THE MASS OR PARTICLE NUMBER OF A PARTICULATE SYSTEM INTO PREDETERMINED FRACTIONS

Walter R. Hogg, Miami Lakes, and Edward Neal Doty, Pompano Beach, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Sept. 16, 1974, Ser. No. 505,970
Int. Cl.² G01N 15/00
U.S. Cl. 235—151.3 21 Claims



1. An apparatus for ascertaining that particle size above and below which size predetermined fractions of one of the total mass and number of the system are respectively included, said particle size being the dividing size between fractions, which comprises:

A. signal producing means including:

i. means for moving a representative sample of a particulate system suspended in a fluid medium relative to a sensing device responsive to movement of individual particles to produce electrical changes in said sensing means proportional to the respective sizes of particles; and

ii. means for producing electrical pulses as a result of such changes, the respective electrical pulses being proportional in amplitude to the size of the respective particles producing the changes;

B. means for generating first representative electrical quantities respectively proportional to the amplitude of said electrical pulses;

C. means for generating second constant representative electrical quantities in response to said electrical pulses;

D. means for separating said representative electrical quantities into two categories on the basis of the size of the particles respectively producing the same, the first category comprising all quantities greater than a measuring level, and the second category comprising all quantities less than the measuring level, said measuring level being calibrated to be proportional to particle size;

E. means for accumulating one of said first and second representative electrical quantities;

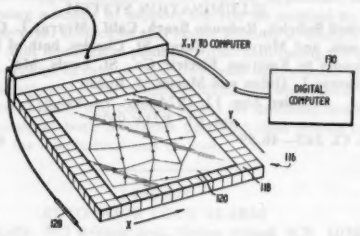
F. means for adjusting the measuring level to produce a desired relationship between categories such that accumulated representative quantities are indicative of said relationship and identifies said dividing size.

3,936,667

PROCESS AND APPARATUS FOR EVALUATING SUBREGIONS

Peter S. Loubal, 700 Grizzly Peak Blvd., Berkeley, Calif. 94708

Filed Apr. 23, 1974, Ser. No. 463,394
Int. Cl.² G06K *11/00*; G06F *7/00*
U.S. Cl. 235—185 **14 Claims**



1. A method of analysing a subregion of a region divided into elemental areas wherein each elemental area has a predetermined parameter value associated with it and is surrounded by a boundary, comprising the steps of:

arranging said elemental areas in a chain-wise topographical order,

preparing a table containing the sums of said parameter values associated with said arranged elemental areas to provide a running sum value for association with each elemental area,

selecting a cross-over point on said boundary of each said elemental area,

physically establishing a border within said region to define said subregion, said border surrounding an integral number of said elemental areas; and,

alternately adding and subtracting said running sum values for each elemental area having a cross-over point which falls on said border,

whereby the total parameter value of all elemental areas within said subregion is determined.

6. An apparatus for analysing a subregion of a region divided into elemental areas wherein each elemental area has a predetermined parameter value associated with it and wherein each parameter value is associated with a selected cross-over point of each said elemental area, comprising:

arranging means for arranging said elemental areas in a chain-wise topographical order,

electrical contact means coupled to said arranging means and located at said selected points for providing electrical signals related to said predetermined parameter values of said elemental areas,

electrical probe means for engaging said electrical contact means and for carrying said electrical signals; and,

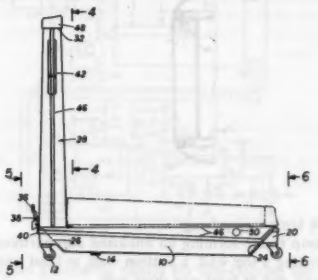
signal processing means coupled to probe means for sensing said electrical signals and for permitting a total parameter value of said subregion to be determined.

3,936,668

APPARATUS FOR VIEWING THE UNDERSIDE OF VEHICLES

Frederick Siebel, Puritan Road, Rye, N.Y. 10580

Filed May 3, 1974, Ser. No. 466,816
Int. Cl.² F21V *33/00*
U.S. Cl. 240—4.2 **6 Claims**



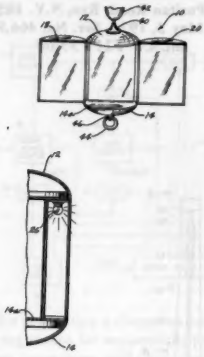
1. Apparatus for viewing the underside of a vehicle comprising a elongated hollow first frame member having front and rear ends and upper and lower surfaces, said upper surface having an aperture formed adjacent at least each of its extreme forward and rearward ends, and means secured to the lower surface for movably supporting said first frame member in a horizontal plane upon a floor, a mirror located beneath each of the apertures facing each other and disposed at an angle to sight through said apertures, a elongated hollow second frame member having upper and lower surfaces interconnected by side walls, said second frame member being open at each end, hinge means securing said second frame member to said first frame member, said hinge means having a first leaf secured to the upper surface of said first frame member adjacent the aperture formed at the rearward end thereof, a second leaf secured to the edge of said second frame member adjacent one end thereof and a pivot axis disposed transversely of said first frame member to permit said second frame member to swing with respect to said first frame member from a closed position substantially overlying said first frame member in a parallel plane thereof, to an open position substantially normal to the plane of said first frame member, said one end of said second frame member being in alignment with the aperture at the rearward end of said first frame member to form an enclosed optical path through said first frame member and said second frame member to the other end of said second frame member, a source of light disposed within said first frame adjacent the aperture at the frontal end of said first frame member and between said facing mirrors, a battery source of power for said lights disposed within one of said first and second frame members and switch means mounted on said second frame member controlling said source of light, said mirrors acting to reflect said source of light onto the undercarriage of said vehicle.

3,936,669

BEAUTY SWAG LAMP

Ruth E. Gardner, Des Moines, Iowa, assignor to Marton C. Gaston and Joan C. Gaston, both of Booneville, Iowa, part interest to each

Filed July 11, 1974, Ser. No. 487,552
Int. Cl.² F21V *33/00*
U.S. Cl. 240—4.2 8 Claims



1. A lamp comprising:

a lamp frame forming an enclosed compartment and comprising a top wall, a bottom wall, at least one upstanding wall and at least one door wall,

said door wall and said upstanding wall each comprising spaced apart inner and outer panels, said outer panels being adapted to let light pass therethrough,

at least one mirror within said compartment;

said door wall being movable from a closed position wherein said compartment and said mirror are hidden from view from outside said compartment to an open position wherein said compartment and said mirror are exposed to view;

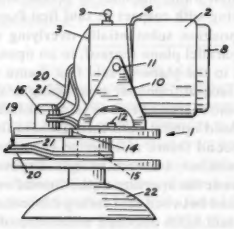
light means comprising at least one light emitting device within the space between said inner and outer panels of each of said door and upstanding walls, said outer panels of said door and upstanding walls permitting light to pass outwardly from said light emitting devices.

3,936,670

PORTABLE LIGHT

Harry Emitt Allen, Sr., 2584 Crape Myrtle St., Shreveport, La. 71108

Filed Oct. 29, 1074, Ser. No. 518,570
Int. Cl.² F21V *13/04*
U.S. Cl. 240—41.3 4 Claims



1. A portable light comprising:

a. a light source;

b. a cylindrically shaped forward cover carrying said light source in the interior thereof and a cylindrically shaped rear cover mating with said forward cover in threaded relationship;

c. a forward cover reflector mounted in the interior of said forward cover;

d. a flat, circular lens removably carried by said forward cover;

e. a cylindrically shaped beam concentrator in cooperation with said lens and said forward cover;

f. a concavo-convex lens reflector mounted on said lens with the concave surface of said reflector facing said light source, and adapted to reflect light from said light source back onto said forward cover reflector and intensify said light;

g. a swivel frame carried by said rear cover in pivoting relationship;

h. an external, horizontally disposed reel in cooperation with said swivel frame and adapted to receive a supply of electric cord thereon in wound fashion; and

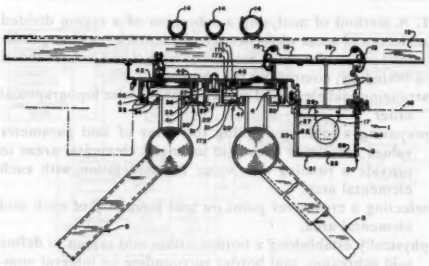
i. a suction cup carried by said reel and adapted to removably adhere to smooth, substantially uniform surface.

3,936,671

ILLUMINATION SYSTEM

Mitchell Bobrick, Redondo Beach, Calif.; Murray L. Quin, St. Louis, and Morris M. Buzan, St. Charles, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo., by said Murray L. Quinn and Morris M. Buzan

Filed Aug. 12, 1974, Ser. No. 496,879
Int. Cl.² F21V *9/08*
U.S. Cl. 240—46.59 4 Claims



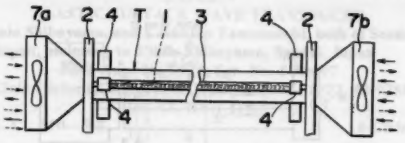
1. In an illumination system for a medical facility, wherein an elongated fluorescent lighting fixture is positioned along a side of an elongated carriage track, the improvement comprising an elongated enclosure for said lighting fixture, a primary lamp enclosure having high brightness light transmitting bottom and side walls, and separate means for reducing light transmission and brightness of the bottom wall and a first side wall of the primary lamp enclosure, said first side wall facing said elongated carriage track, said means for reducing light transmission and brightness of the bottom wall and a first side wall of the primary lamp enclosure comprising a separate L-shaped diffuse transmitting insert mounted within the primary lamp enclosure.

3,936,672

ILLUMINATION DEVICE FOR COPYING MACHINE

Atsuyuki Tanaka, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 1, 1974, Ser. No. 484,890
Claims priority, application Japan, Aug. 6, 1973, 48-92565[U]
Int. Cl.² F21V 29/00
U.S. Cl. 240—47 4 Claims



1. An illumination device for use in a copying apparatus of a type wherein the optical system comprises an image transmitter formed by a bundle of optical fibers having a refractive index distribution in the cross section thereof, said illumination comprising a substantially U-sectioned casing having a pair of adjoining side edges which define an opening facing a transparent support surface of the copying apparatus, said surface being adapted to support thereon an original to be copied, the inner surface of said casing forming a reflector, a source of light mounted in position within said casing, means for, upon receipt of rays of light from said light source, producing a slit-shaped beam of light to illuminate the original on the support-surface, and cooling means for directing cooling air alternately in both directions past said light source and parallel to the longitudinal axis thereof.

3,936,673

AUTO DOOR LOCK ALARM

John F. Kelly, 393 Britton Ave., Staten Island, N.Y. 10304, and Frank Rizzo, 200 Catherine St., Staten Island, N.Y. 10302

Filed Feb. 24, 1975, Ser. No. 552,306
Int. Cl.² B60R 25/00
U.S. Cl. 307—10 AT 10 Claims

1. A combination key operated vehicle door lock and burglar alarm switch comprising:

a. a cylindrical lock adapted to be mounted on a vehicle door including, an approximately semi-circular shaft axially extending therefrom and capable of being rotated an arcuate amount of either direction by a key;

b. latch means for controlling the opening of the door, rotatably mounted on said shaft, and

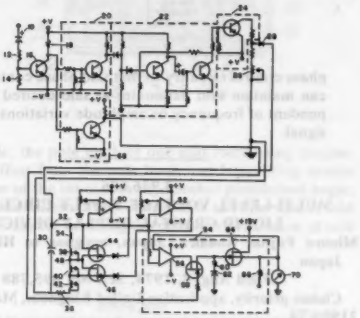
c. switch means for completing the electrical circuit of a burglar alarm, also rotatably mounted on said shaft, each of said latch means and said switch means including, a circular opening receiving said shaft and a notched portion extending into the circular opening above the semi-circular shaft, whereby when said semi-circular shaft is rotated in one direction, it engages both said notched portions to rotate said latch means and said switch means in one direction to open the door and simultaneously open the electrical circuit, and when said shaft is rotated in the opposite direction it engages both said notched portions to rotate said latch means and said switch means in said opposite direction to lock the door and simultaneously complete the electric circuit.

3,936,674

RATE SIGNAL GENERATOR CIRCUIT

Philip A. Hughes, Littleton, Colo., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 5, 1974, Ser. No. 448,293
Int. Cl.² H03K 1/16; H03B 3/04
U.S. Cl. 307—233 R 3 Claims



1. A rate signal generating circuit for determining the rate of recurrence of electrical signals, said circuit comprising means for sensing said electrical signals, a capacitor, charging circuit means connected between said sensing means and said capacitor to charge said capacitor to a predetermined voltage level during a predetermined time interval in response to the sensing of one of said electrical signals, a plurality of resistors connected in series and coupled to said capacitor to provide a discharge path therefor, electronic switch means connected to said resistors and said capacitor for shorting selected said resistors in response to predetermined charged voltages across said capacitor, wherein said capacitor discharges to define a rate function, and sample and hold means coupled to said capacitor and said sensing means for actuation by each successive said electrical signal to provide an output voltage proportional to the rate of recurrence of said signals.

3,936,675

REFERENCE POINT POTENTIAL COMPENSATING CIRCUIT FOR USE WITH PHASE CONTROLLER

Tetsuo Yoshida, Tokyo, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,015
Claims priority, application Japan, Dec. 29, 1972, 48-3722
Int. Cl. H03k 17/00, 1/12; G05f 3/00
U.S. Cl. 307—252 F 4 Claims

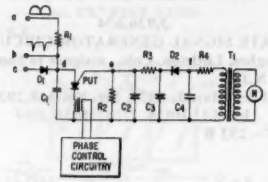
1. Reference point potential compensating circuitry for controlling phase control circuitry, which regulates the value of a predetermined parameter, said compensating circuitry comprising means for generating a first signal which varies in amplitude periodically with time;

means for generating a second signal, the amplitude of which varies as a function of said predetermined parameter;

means for adding all values of said first and second signals to develop a third signal which is a substantially linear sum of said first and second signals;

means, responsive to said first signal, for generating a fourth signal, the amplitude of which is a function of the frequency of said first signal and which is representative of a desired value of said parameter;

means for comparing said third and fourth signals to generate a fifth signal when said third and fourth signals are substantially equal, said fifth signal being applied to said



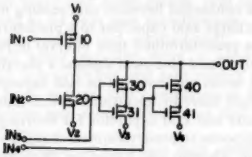
phase control circuitry so that said phase control circuitry can maintain said parameter at said desired value independent of frequency or amplitude variations of said first signal.

3,936,676

MULTI-LEVEL VOLTAGE SUPPLY CIRCUIT FOR LIQUID CRYSTAL DISPLAY DEVICE

Minoru Fujita, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 8, 1974, Ser. No. 495,788
Claims priority, application United Kingdom, May 16, 1974, 21904/74
Int. Cl.² H03K 19/08, 1/02; G02F 1/13; H01L 29/78
U.S. Cl. 307—270 8 Claims



1. A voltage supply circuit comprising:

first and second switching means each of said first and second switching means having an input electrode, an output electrode, and a control electrode, the input and output electrodes of said first and second switching means being connected in series between first and second voltage sources;

at least one pair of field-effect transistors, the source and substrate regions of which are respectively connected in common, and the gate electrodes of which are connected together;

first means for connecting the drain region of one of said field-effect transistors to a common connection of said first and second switching means;

second means for connecting the drain region of the other of said field-effect transistors to a third voltage source, the voltage level of which lies between the voltage levels of said first and second voltage sources;

third means for deriving an output voltage from the common connection of said first and second switching means and;

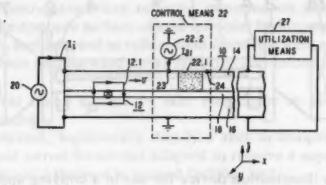
fourth means for applying input voltages respectively to the control electrodes of said first and second switching means and to the gate electrodes of said at least one pair of field-effect transistors, whereby said output voltage will have a voltage level corresponding to the level of one of said first through third voltage sources.

3,936,677

SUPERCURRENT DEVICE FOR CONTROLLING MOBILE FLUX VORTICES

Theodore Alan Fulton, Warren Township, Somerset County, N.J., and John Kirtland Galt, Albuquerque, N. Mex., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 21, 1975, Ser. No. 542,712
Int. Cl.² H03K 3/38, 19/195, 17/92
U.S. Cl. 307—306 17 Claims



1. Superconductive apparatus comprising

a supercurrent transmission line which includes a pair of superconductive layers and a weak-link layer separating said superconductive layers and contigous therewith,

said line being adapted to support the propagation of mobile flux vortices therein and having a length, as measured in the direction of said propagation, which is much greater than the Josephson penetration depth λ_J,

characterized in that said apparatus includes means for changing the velocity of said vortices comprising

a normal metal segment which interrupts at least one of said superconductive layers in the direction of said propagation, and

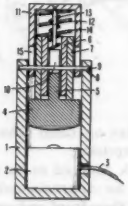
control means for applying a control current in a region of said line in operative relation to said segment.

3,936,678

MAGNETICALLY LATCHED PIEZOELECTRIC STRIKING IGNITER

Walter Mohr, Frankfurt am Main, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 12, 1974, Ser. No. 496,588
Claims priority, application Germany, Aug. 8, 1973, 2341544; Aug. 17, 1973, 2341714
Int. Cl.² H01L 41/04
U.S. Cl. 310—8.7 8 Claims



1. A piezoelectric igniter with a striking mechanism, more especially for lighters, having a piezoelectric transducer, a hammer which is movable in the direction of the latter and which co-operates with an energy storing spring which can be compressed by an actuating member, having a movement release device for the hammer and having a housing which surrounds these parts and against the one front end of which the piezoelectric transducer butts, wherein the movement release device forms a magnetic holding circuit comprising a permanent magnet (45) with laterally mounted pole plates (46), which is fixed in the housing and which is magnetized

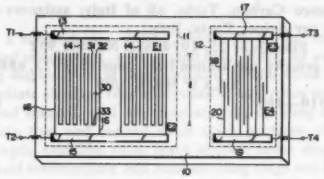
transversely to the direction of movement of the hammer (42) and which has a free axial passage, the energy storing spring (44) lies in a blind hold in the hammer (42), which blind hole is in alignment with the axial passage and is biased by a holding member (43) which is fastened to the hammer, and wherein the actuating member (47) comprises a shank which extends into the axial passage and which is provided with a slot (60) at the points of the holding member.

3,936,679

ELASTIC SURFACE WAVE TRANSDUCER

Kimio Shibayama, and Kazuhiko Yamanouchi, both of Sendai, Japan, assignors to Kimio Shibayama, Sendai, Japan

Filed Aug. 26, 1974, Ser. No. 500,697
Claims priority, application Japan, Aug. 31, 1973, 48-97886
Int. Cl. H01l 41/08
U.S. Cl. 310—9.8 10 Claims



1. An elastic surface wave interdigital transducer comprising:

a piezoelectric substrate;

first and second electrodes disposed on said piezoelectric substrate, each of said first and second electrodes having a common electrode connected to an external terminal and a plurality of electrode fingers connected to said common electrode, the electrode fingers of said first electrode overlapping with and being interdigitated by the electrode fingers of said second electrode, the overlap lengths of the interdigital electrode fingers of said first and second electrodes being substantially uniform throughout the transducer; and

a plurality of floating electrodes, each floating electrode including a pair of parallel conductors connected together at one end, said floating electrodes being disposed on said piezoelectric substrate between said interdigital electrode fingers of said first and second electrodes, the number of said floating electrodes located between respective pairs of said interdigital electrode fingers progressively increasing from the center of said transducer to both ends of said transducer.

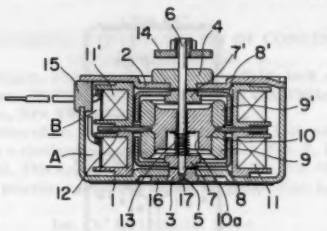
3,936,680

MINIATURE SELF-STARTING ELECTRIC MOTOR

Tomohisa Kuwako, Anjo; Toshio Tanase, Gifu, and Naoshi Sasase, Toyohashi, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed July 9, 1974, Ser. No. 486,789
Claims priority, application Japan, July 10, 1973, 48-77684; July 11, 1973, 48-78145
Int. Cl.² H02K 11/00, 21/26
U.S. Cl. 310—40 MM 9 Claims

1. A miniature self-starting electric motor comprising a rotor shaft rotatably disposed in a casing; two rotors fixed to said rotor shaft and each having a circular body portion of soft magnetic material, each said circular body portion having a periphery with pole teeth extending therefrom and spaced from each other at equal angular spacings; two exciting coils each being disposed to face the pole teeth; two permanent magnets each providing radially north and south poles alternating at an equal angle, the poles of each said permanent magnet being axially aligned with poles of the same polarity of the other magnet, the poles of each said permanent magnet facing the pole teeth of the corresponding rotor, the number of poles on each permanent magnet being an even multiple of the number of pole teeth, said two rotors being opposed to each other, the pole teeth of one of said two rotors being staggered from the pole teeth of the other by a predetermined



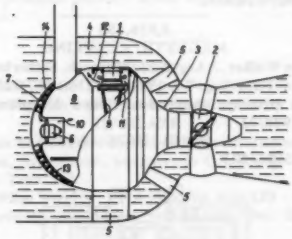
electric angle; the pole teeth of one said rotor being circumferentially offset from the pole teeth and intervening spaces therebetween of the other rotor by another preselected angle; and a condensor alternatively connectible to either one of said two exciting coils for selecting the direction of rotation of said motor.

3,936,681

COOLING ARRANGEMENT FOR ELECTRIC GENERATORS OF UNDERWATER POWER PLANTS

Wolfgang Liebe, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 16, 1973, Ser. No. 416,522
Claims priority, application Germany, Dec. 4, 1972, 2259738
Int. Cl.² H02K 9/00
U.S. Cl. 310—54 9 Claims



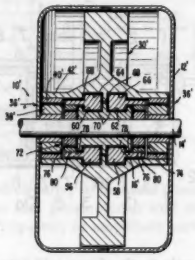
1. In an underwater electric generator contained in a body wherein coolant is circulated for cooling the generator, a cooling arrangement including a cowl covering the end-face of the generator and forming a portion of the body, the outer surface of the cowl being exposed to the turbine water and the inner surface of the cowl defining an arcuate path for conducting the coolant therealong for recooling the coolant, the improvement in said cooling arrangement comprising: a plurality of cooling fins, each of the fins being made from a flat member and having two end-portions bent toward each other to give the fin a hook-like configuration, each of the fins being fixedly mounted to the inner surface of the cowl at one of said end-portions thereof and being short relative to the length of the path.

3,936,682

GAS BEARING REACTION WHEEL

Robert Lee Gates, Littleton, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Sept. 14, 1972, Ser. No. 289,028
Int. Cl. H02k 7/00
U.S. Cl. 310—66 12 Claims



1. In a momentum exchange actuator including relatively movable first and second generally concentric, rotary members mounted for rotation about a common axis and first driving means for bidirectionally driving one member relative to the other about said axis, the improvement comprising:

at least one intermediate third member positioned between said first and second members and generally concentrically thereto for rotation about said axis,

second driving means for driving said intermediate member substantially faster than said driven one member when said intermediate member is rotated in the same direction as said one member, and

hydrodynamic fluid bearing means carried by said intermediate member on both surfaces thereof, responsive to rotation of said intermediate member and acting respectively on said first and second members,

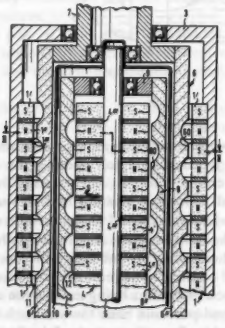
whereby, regardless of reversal in direction of motion or cessation of motion between said first and second members, there is no loss of the hydrodynamic fluid bearing between said intermediate member and said first and said second members.

3,936,683

MAGNETIC COUPLING

Alan John Walker, 3 Argyle St., Dornoch, Sutherland, England

Filed Aug. 16, 1974, Ser. No. 497,925
Claims priority, application United Kingdom, Aug. 17, 1973, 38988/73
Int. Cl.² H02K 49/06
U.S. Cl. 310—103 8 Claims



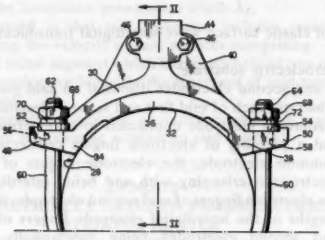
1. A magnetic transmission device by which torque can be transmitted without contact of the driving and driven elements comprising a first stationary magnetic pole ring, a second stationary magnetic pole ring circumferentially surrounding and radially spaced from said first magnetic pole ring, a first rotatable torque transmitting ring connected to one of said elements and having an even number of axially aligned bars of highly magnetic material causing a magnetic connection between said first pole ring and said second pole ring, and a second rotatable torque transmitting ring connected to the other of said elements with the first torque ring circumferentially surrounding and being radially spaced from said second torque ring and with said first and second torque transmitting rings separating said magnetic rings in the radial direction.

3,936,684

ANGULAR VELOCITY DETECTOR ASSEMBLY FOR WHEELS OF MOTOR VEHICLES HAVING ANTI-SKID BRAKE SYSTEMS

Giovanni Anselmino, Turin; Roberto Pozzetto, Collegno, and Gianfranco Carollo, Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed June 25, 1974, Ser. No. 482,932
Claims priority, application Italy, June 25, 1973, 68882/73
Int. Cl.² H02K 5/00
U.S. Cl. 310—168 1 Claim



1. In an electromagnetic angular velocity transducer assembly for a vehicle wheel of the type comprising a toothed wheel and an electromagnetic pick-up device relatively moveable with respect to said toothed wheel upon rotation of said vehicle wheel upon which said toothed wheel is mounted, a mounting support for said electromagnetic pick-up comprising a curved body having a substantially semi-cylindrical surface adapted to be mounted on a cylindrical shaft, means securing said electromagnetic pick-up device adjacent the midpoint of said body intermediate the end thereof, a pair of recesses formed in said semi-cylindrical surface of said body adjacent to, but spaced inwardly from each end of said body to reduce the thickness of said body, an apertured lug integral with an extending outwardly from each end of said body, curved tie rod means adapting to extend around said shaft with the opposite ends thereof extending through said apertured lugs and threaded means for securing the ends of said tie rod to said lugs; said semi-cylindrical surface of said body between said recesses being substantially greater than the distances from said recesses to the ends of said body while the reduced thickness of said body in the vicinity of said recesses allows for the flexing of the ends of said body upon tightening of said threaded means to bring the ends of said body into contact with a shaft having a radius of curvature less than the radius of curvature of said semi-cylindrical surface of said body.

3,936,685

ROTOR STACK FOR A SQUIRREL-CAGE, SLIDING ROTOR TYPE MOTOR

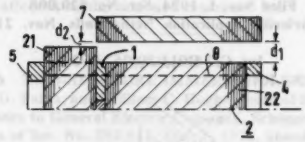
Ehard Glockner, Eibelstadt, and Bodo Ulrich, Lengfeld, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 25, 1974, Ser. No. 464,199

Claims priority, application Germany, Apr. 27, 1973, 2321435

Int. Cl.² H02K 23/44

U.S. Cl. 310—209 6 Claims



1. In a squirrel-cage sliding rotor type motor, including a laminated stator stack, a laminated rotor stack, an axial shorting ring disposed on at least one end of said rotor stack, an intermediate shorting ring interposed in said rotor stack at the other end thereof, said intermediate ring dividing said rotor stack into first and second rotor stack sections of unequal axial length, said first rotor stack section being disposed between said intermediate and axial shorting rings and having an axial length greater than said second rotor stack section, the latter being disposed between said intermediate shorting ring and said other end of said rotor stack, and rotor bars disposed axially through said rotor stack and coupled by said shorting rings, the improvement comprising a second rotor stack section having a diameter greater than that of said first rotor stack section.

3,936,686

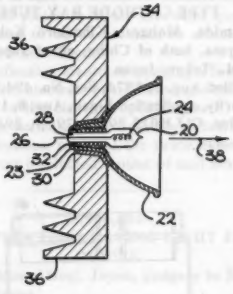
REFLECTOR LAMP COOLING AND CONTAINING ASSEMBLIES

Donald W. Moore, 827 Montline Lane, Los Angeles, Calif. 90024

Filed May 7, 1973, Ser. No. 357,823

Int. Cl.² H01J 61/52; H01K 1/58

U.S. Cl. 313—36 6 Claims



1. In combination,

a. a high brightness incandescent lamp having an operating temperature and a seal end temperature substantially high in comparison to the corresponding temperature of inert gas incandescent lamps,

b. means for dissipating heat from the seal end of said incandescent lamp comprising a mass of material having the heat conductivity characteristic thereof at least that of metals and of a quantity sufficient to prevent failure of the seal end region of said lamp, and

c. flexible heat conductive adhesive means between said lamp seal end and said heat dissipating means for adhering said lamp and said heat dissipating means and for allowing expansion of said heat dissipating means and said lamp seal end without injury to the latter, said adhesive means comprising a flexible material of low heat conductivity combined with a material of high heat conductivity.

3,936,687

PHOTOCATHODE WITH PLURALITY OF CONCENTRIC CONDUCTING RINGS

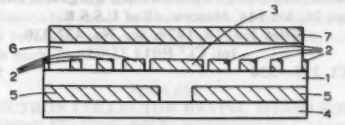
Pieter Schagen, and Pamela May Stubberfield, both of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 395,913, Sept. 10, 1973, abandoned, which is a continuation of Ser. No. 224,923, Feb. 9, 1972, abandoned. This application July 18, 1974, Ser. No. 489,578

Claims priority, application United Kingdom, Mar. 1, 1971, 5655/71

Int. Cl.² H01J 39/18, 39/04

U.S. Cl. 313—101 4 Claims



1. A photocathode comprising a support having an insulating layer with an aperture therein, a layer of photoemissive material spaced from said insulating layer, a layer of electrically resistive material supported by said electrically insulating layer and in electrical contact with said layer of photoemissive material, a plurality of spaced, discrete, concentric electrically conductive rings and a central conductive disc within the innermost ring disposed on one surface of said layer of electrically resistive material, and means to apply a potential between the central disc and the outermost ring including a conductive member having an electrical connection to said central disc through said aperture in said insulating layer for obtaining a potential gradient across said layer of photoemissive material.

3,936,688

GAS DISCHARGE PANEL HAVING ELECTRODES SECURED TO FLAT INSULATING PLATES BY MEANS OF GLAZE

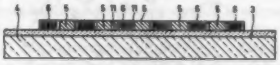
Johannes van Esdonk, and Johannes Petrus Hornman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,133

Claims priority, application Netherlands, Dec. 22, 1973, 7317648

Int. Cl.² H01J 61/30

U.S. Cl. 313—220 3 Claims



1. A gas discharge panel comprising an insulating base plate and an insulating transparent top plate, said plates each having a set of parallel conductors, the conductors of the base plate and the top plate crossing each other at an angle and defining cavities therebetween in which an electric discharge can occur, the conductors of at least one set being secured to the insulating plate by means of a glass which melts below 570°C, the sides of adjacent conductors being separated by insulating partitions of superficially oxidized aluminum strips which are secured on the insulating plate.

3,936,689

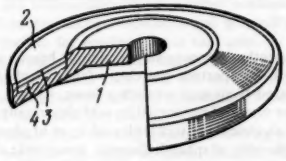
ROTARY ANODE FOR POWER X-RAY TUBES AND METHOD OF MAKING SAME

Tatyana Anatolievna Birjukova, ulitsa Kropotkinskaya, 13, kv. 17; Nikolai Ivanovich Freze, ulitsa Fersmana, 5, kv. 13; Alexei Alexeevich Schukin, 2 Kolobovsky pereulok 14, kv. 28; Anatoly Vasilievich Abalikhin, ulitsa Amurskaya, 21, korpus 3, kv. 52; Mikhail Vasilievich Maltsev, ulitsa Streletskaya, 26a, kv. 40; Nikolai Nikolaevich Evgrafov, ulitsa Kolenchataya, 13/17, kv. 4, all of Moscow; Sergei Gavrilovich Semenov, ulitsa Lomonosova, 26, kv. 17, Leningrad; Valentina Pavlovna Zhukova, Moskovskoe shosse, 36, kv. 29, Leningrad; Maria Ilinichna Teumin, ulitsa Grazhdanskaya, 112, korpus 2, kv. 87, Leningrad; Veronika Vasilievna Isaichenko, ulitsa Kronverkskaya, 25, kv. 32, Leningrad; Mikhail Minovich Nerodenko, ulitsa Observatornaya, 8, kv. 8, Kiev; Galina Nikolaevna Alexeenko, ulitsa Dovnar-Zapolskogo, 8, kv. 86, Kiev; Alexei Fedorovich Tetervak, ulitsa Volodarskogo, 22, kv. 9, Kiev; Samuil Mordkovich Gurevich, ulitsa Lesi Ukrainki, 2, kv. 2, Kiev; Grigory Vasilievich Tjukalov, Varshavskoe shosse, 18, korpus 2, kv. 241, Moscow, and Georgy Vladimirovich Kurganov, ulitsa Lipetskaya 26, kv. 144, Moscow, all of U.S.S.R.

Filed Jan. 10, 1974, Ser. No. 432,330

Int. Cl.² H01J *35/08*

U.S. Cl. 313—330 **5 Claims**



1. A rotating anode for X-ray tubes, comprising a body of melted metal selected from the group consisting of molybdenum and alloys based thereon and a composite coating of tungsten-rhenium alloy, said anode having a composition varying so that an outer layer of tungsten-rhenium has constant rhenium content followed by a layer of tungsten-rhenium-molybdenum alloys with the content of rhenium decreasing towards the interior and the content of molybdenum increasing.

3,936,690

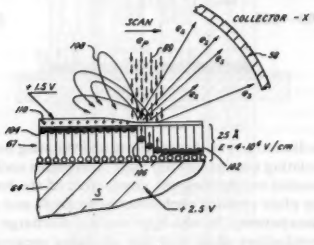
MOBILE ION FILM MEMORY

Francis John Salgo, Dallas, Tex., assignor to Butler, Binion, Rice, Cook & Knapp, Houston, Tex.

Filed Sept. 19, 1974, Ser. No. 507,278

Int. Cl.² H01J *31/58, 29/10*

U.S. Cl. 313—392 **34 Claims**



1. A data storage apparatus comprising

a plurality of charged particles;

a film adapted to contain the charged particles in a plurality of positions;

writing means for altering said particles' positions within said film; and

reading means for determining the presence of said particles at each of said positions in said film

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3,936,691

COLOR CATHODE RAY TUBE FRAME-COLOR SELECTION ELECTRODE SUPPORT STRUCTURE

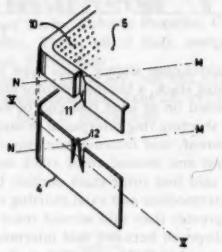
Gijsbertus Bakker, and Johannes Aloysius van Leeuwen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,008

Claims priority, application Netherlands, Nov. 21, 1973, 7315905

Int. Cl.² H01J *29/06, 31/20*

U.S. Cl. 313—407 **6 Claims**



1. A color cathode ray tube comprising an evacuated envelope and, within said envelope, means for generating at least two electron beams, a display screen on a part of the wall of said envelope, a substantially rectangular color selection electrode located near the display screen, a supporting frame spaced from and surrounding the edge of said color selection electrode, and a plurality of resilient supporting strip-shaped members connecting edge portions of said electrode to said frame, each supporting member being twisted near its center such as to be resilient both in radial and in tangential directions with respect to the center of said electrode.

3,936,692

ELECTRON GUN ASSEMBLY FOR USE IN MULTI-BEAM TYPE CATHODE RAY TUBE

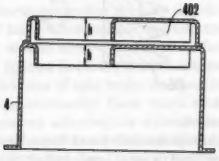
Yukihiro Izumida, Mobara; Kihachiro Koizumi, and Yoshihiko Miyata, both of Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1974, Ser. No. 494,754

Claims priority, application Japan, Aug. 8, 1973, 48-88423

Int. Cl.² H01J *29/50, 29/51, 29/82*

U.S. Cl. 313—414 **7 Claims**



1. A multi beam type electron gun assembly for use in a cathode ray tube comprising a plurality of electron guns including a plurality of cathode electrodes emanating electron beams directed toward a fluorescent screen and a plurality of grid electrode structures which are constituted with a plurality of common electrodes comprising each grid electrode which has identical function in respective electron guns, said common electrodes being formed integrally, one of said common

electrodes comprising a hollow side wall member forming an enclosure surrounding all paths of the electron beams and an end member, said end member comprising two plate members, each plate member having a plurality of openings being used for the passage of the electron beams and each opening being provided with an axially extending peripheral flange formed integrally along the respective peripheries of said openings, said flanges being close-aligned respectively by superposing said plate members with each other to have an aggregate axial height at least not less than half the diameter of said opening, whereby an electric field occurred in the neighborhood of said openings is prevented from being adversely affected by the side wall member.

3,936,693

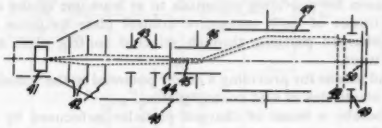
TWO-APERTURE IMMERSION LENS

Harold G. Parks, and William C. Hughes, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 294,021, Oct. 2, 1972, abandoned. This application May 8, 1974, Ser. No. 467,999

Int. Cl.² H01J *29/62, 29/80*

U.S. Cl. 313—427 **5 Claims**



1. In an electron beam optical system including a source of electrons, coarse deflection means for directing said electrons toward an electron focussing means in the form of an electron beam, and means for focussing said beam on a target, the improvement comprising:

said focussing means consisting solely of a pair of substantially parallel plates spaced apart from each other and positioned between all of said coarse deflection means and said target, each plate having a plurality of substantially circular apertures therein with said apertures in each plate aligned along the optical axis of said electrom beam so as to form a matrix of lenslets, and means for biassing said plates to cause electrons passing through said apertures to be accelerated or decelerated before impinging on said target;

said coarse deflection means comprising a first assembly for deflecting the electron beam from said source from the center axis of the electron optical system, and a second assembly for deflecting the deflected electron beam in an opposite direction to cause the twice deflected electron beam to enter a selected lenslet of said matrix.

3,936,694

DISPLAY STRUCTURE HAVING LIGHT EMITTING DIODES

Katsuhiko Akiyama, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,173

Claims priority, application Japan, Dec. 28, 1973, 49-3360; Nov. 21, 1974, 49-134643

Int. Cl.² H01I *15/00*

U.S. Cl. 313—500 **12 Claims**

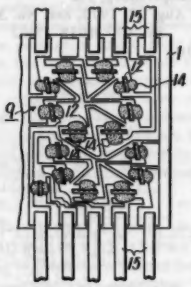
1. A display structure comprising:

a. a substrate of insulating material;

b. a plurality of light emitting diodes disposed on one major surface of said substrate in a predetermined pattern with their pn junctions perpendicular to said substrate;

c. multi-layer paths carried on said one surface of said substrate, at least the outer layer of which is formed of conductive material;

d. said paths being shaped to provide recesses, each larger than the width of a diode;



e. said diodes being in said recesses with the outer layer of an associated one of said multi-layer paths bent down into said recess to mechanically grip and electrically connect with each diode.

3,936,695

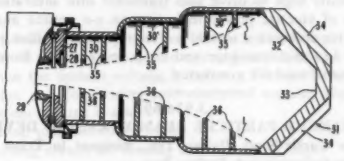
ELECTRON COLLECTOR HAVING MEANS FOR TRAPPING SECONDARY ELECTRONS IN A LINEAR BEAM MICROWAVE TUBE

Robert C. Schmidt, Woodside, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 26, 1974, Ser. No. 464,420

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **5 Claims**

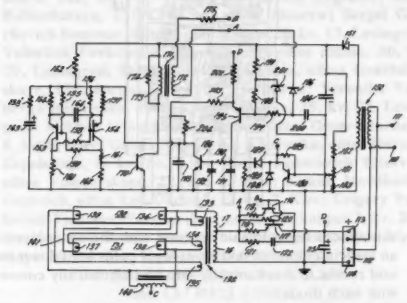


1. A linear beam electron discharge device dimensioned to operate under preselected parameters of voltage, fields and frequencies comprising: electron gun means for forming and projecting a beam of electrons over an elongated path extending from an upstream end of said device, wave beam interaction circuit means axially coextensive with and adjacent to a portion of said beam path for velocity modulating said beam at said preselected frequencies, means for extracting an output radio frequency signal from said velocity modulated beam at the downstream end of said device, hollow collector means within which said beam expands in transverse cross section in the downstream direction, the inner surfaces of said collector means being dimesnioned with respect to the shape of said expanding cross sections when said device is operated under said parameters, said inner surfaces of said collector means comprising, at the upstream end thereof, a constricted entrance portion dimensioned to allow passage of said beam therethrough; at the downstream end thereof, an electron impact portion dimensioned to intercept substantially all of said beam and dissipate its energy; and between said entrance portion and said impact surface portion, and electrically conductive wall portion dimensioned to surround said beam; said wall portion comprising outer transverse cross sections substantially outside said beam, said wall portion further comprising a plurality of baffle members spaced along the direction of said beam, said baffle members extending inwardly from said outer transverse cross sections to define apertures with peripheries outside said beam.

3,936,696
DIMMING CIRCUIT WITH SATURATED SEMICONDUCTOR DEVICE

George Gray, Lambertville, N.J., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Aug. 27, 1973, Ser. No. 391,953
Int. Cl.[2] H05B 37/02
U.S. Cl. 315—210 31 Claims

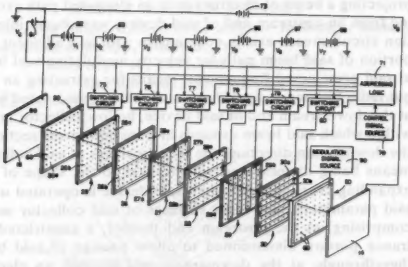


1. An energizing circuit for a gas discharge lamp; said energizing circuit including a source of electric power, oscillator circuit means for producing a pulse current at a relatively high frequency, and a pulse modulator circuit which includes a transistor having base, collector and emitter electrodes; said source of electric power, said emitter and collector electrodes of said transistor and said gas discharge lamp being connected in series; said oscillator circuit means being connected to said transistor to inject said pulse current into said base of said transistor; said pulse current having a minimum magnitude sufficiently high to drive said transistor into saturation; said source of electric power including an a-c source and a d-c converter connected to said a-c source; said oscillator circuit means and said transistor and lamp being driven from the d-c output of said d-c converter.

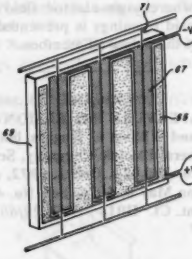
3,936,697
CHARGED PARTICLE BEAM SCANNING DEVICE

Warner Curtis Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 25, 1974, Ser. No. 463,934
Int. Cl.[2] H01J 29/41
U.S. Cl. 315—12 R 9 Claims



1. A charged particle beam scanning device comprising:
an area source of charged particles for providing a uniform flow of charged particles over a predetermined area, said area source including elongated charged particle generating means for generating charged particles, a first electrode having a negative potential, positioned behind said generating means, and a second electrode having a positive potential interdigitated with said first electrode
an area target,
a plurality of control plates sandwiched between said source and said target for controlling the flow of charged particles therebetween, each of said control plates having a plurality of apertures formed therein, corresponding apertures of said control plates being aligned to form charged particles beam channels between the source and the target, said control plates each having a plurality of electrodes on at least one of the surfaces thereof, said electrodes on each of said surfaces being electrically insulated from each other,

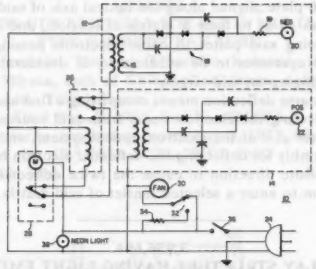


means for providing potentials to at least one of the electrodes of each successive control plate to focus said charged particles through selected control plate apertures,
and means for providing a cutoff potential to the remaining electrodes of said control plates,
whereby a beam of charged particles is focused by said focusing potentials through the channels formed by said selected apertures.

3,936,698
ION GENERATING APPARATUS

George F. Meyer, 6995 Trolley Way, Playa del Rey, Calif. 90291

Continuation of Ser. No. 21,284, March 20, 1970. This application Aug. 27, 1973, Ser. No. 391,937
Int. Cl. H01j 3/04
U.S. Cl. 317—4 8 Claims



1. Ion generating apparatus for exposing a subject such as a patient or the like to an ion flow, comprising, in combination:
first ion generating means for generating negatively charged ions comprising a first electrode and first power supply means for applying a negative voltage to said first electrode;
second ion generating means for generating positively charged ions comprising a second electrode and second power supply means for applying a positive voltage to said second electrode;
means for blowing air across said first and second electrodes; and
timing means for alternately energizing said first and second power supply means in a predetermined time cycle, said time cycle having a first negative ion emitting time por-

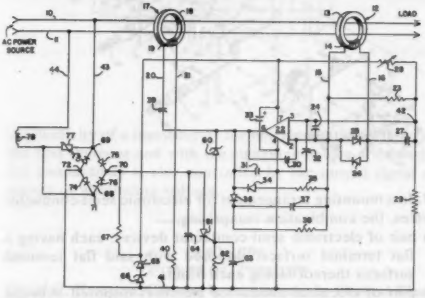
tion and a second positive ion emitting time portion in which said second time portion is sufficiently long to at least neutralize any negative charge accumulated by the subject during said first time portion, whereby the subject does not saturate in a condition of repelling negatively charged ions and continues to receive the benefits of negatively charged ions as long as said apparatus remains energized.

3,936,699

GROUND FAULT PROTECTIVE CIRCUITRY

William H. Adams, Pompey, N.Y., assignor to Pass & Seymour, Inc., Syracuse, N.Y.

Filed Nov. 30, 1973, Ser. No. 420,654
Int. Cl.² H02H *3/28*
U.S. Cl. 317—18 D **9 Claims**



1. A protective system for use in an electrical system having at least a first conductor and a second conductor extending from a source of alternating current to a load, said protective system comprising:

a. a transformer having a core, a primary on said core and a secondary formed by said at least first and second conductors;

b. an amplifier;

c. means to couple the output of said amplifier to said primary of said transformer; and

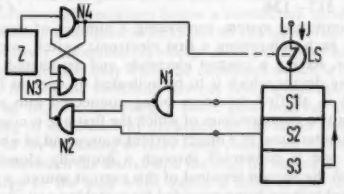
d. means including said transformer for causing said amplifier to break into self-sustained oscillations upon the occurrence of a given event relating to said at least first and second conductors.

3,936,700

ELECTRONIC OVERCURRENT PROTECTION OF A DC DATA TRANSMISSION CIRCUIT

Herbert Reiter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1974, Ser. No. 529,494
Claims priority, application Germany, Dec. 5, 1973, 2360689
Int. Cl.² H02H *5/00*
U.S. Cl. 317—22 **9 Claims**



1. A circuit arrangement for protecting a transmission circuit against over-current conditions, said circuit including at least two threshold logic elements for evaluation of current conditions on said line, characterized by,

an additional threshold responsive logic element whose output is coupled to at least one of said threshold logic circuits for controlling the output signal level thereof in response to current in said circuit in excess of said threshold,

overcurrent logic signalling means having an input connected to the output of said two threshold logic elements,

a line switch connected in said transmission circuit for controlling the passage of said current to said threshold logic elements, the state of said switch being fixed by the output of said over-current logic signalling means, whereby said switch is opened upon indication of the over-current condition by said two threshold devices,

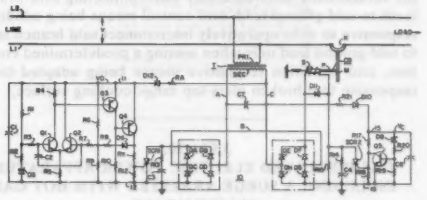
and a supplementary monitoring circuit having an output directed to said switch for returning the state thereof to the initial condition, thereby reclosing said line switch.

3,936,701

TIMING CIRCUIT FOR ELECTRONIC UNDERVOLTAGE DETECTING DEVICE AND LATCH

John T. Wilson, and Wardell Gary, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1974, Ser. No. 501,561
Int. Cl.² H02H *3/24*
U.S. Cl. 317—31 **5 Claims**



1. An undervoltage protection device, comprising:

a. circuit breaker means for opening an electrical system when the system voltage is below a first predetermined value and for closing said electrical system when said system voltage is above

a second predetermined value;

b. sensing means for sensing said system voltage;

c. alternating current coil means energizable at a predetermined alternating coil voltage for preventing said circuit breaker means from closing upon said electrical system, said coil means controlling a spring loaded plunger means, said coil means when energized with said predetermined coil voltage keeping said spring loaded plunger means from causing said circuit breaker means to close upon said electrical system;

d. control means interconnected with said sensing means and said coil means, said control means deenergizing said coil means when said system voltage is below said first predetermined value but applying a coil voltage significantly larger than said predetermined coil voltage to said coil means for a predetermined period of time to positively load said plunger means against its spring to allow said circuit breaker means to be closed by independent means when said system voltage is above said second predetermined value, said control means thereafter maintaining said coil means at said predetermined coil voltage.

3,936,702

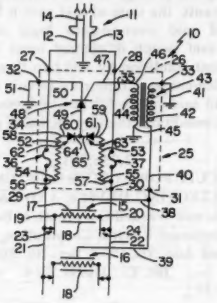
ELECTRICAL PROTECTION MEANS

Emil Robert Plasko, Washington Township, Ohio, assignor to Micro Devices Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 229,120, Feb. 24, 1972, abandoned. This application Jan. 8, 1973, Ser. No. 321,752
Int. Cl.² H01H *83/00*
U.S. Cl. 317—40 A **2 Claims**

1. In combination, a ground lead, a pair of main leads for interconnecting an electrical power source to at least one

electrically operated unit, each main lead having a thermally activated device therein for opening the respective main lead when said device is activated, said main leads being respectively interconnected to a pair of branch leads respectively having a pair of electrically operated heating means therein for respectively activating said devices when said branch leads are operatively interconnected to ground, and control means



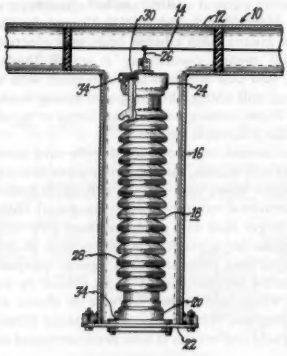
for substantially simultaneously interconnecting said branch leads to said ground lead, said control means being condition responsive so as to operatively interconnect said branch leads to said ground lead only when sensing a predetermined condition, said condition responsive means being adapted to be responsive to a broken glass-top range cooking surface.

3,936,703

GAS-INSULATED ELECTRIC POWER APPARATUS INCLUDING A SURGE ARRESTER WITH HOT GAS RELIEF MEANS

Eugene C. Sakshaug, Lanesborough, Mass., assignor to General Electric Company, N.Y.

Filed July 11, 1974, Ser. No. 487,656
Int. Cl.[2] H02H 9/06
U.S. Cl. 317—62 1 Claim



1. Electrical power apparatus of the type having a grounded metal enclosure containing an insulating gas and having a voltage surge arrester mounted inside said enclosure, wherein the improvement comprises:

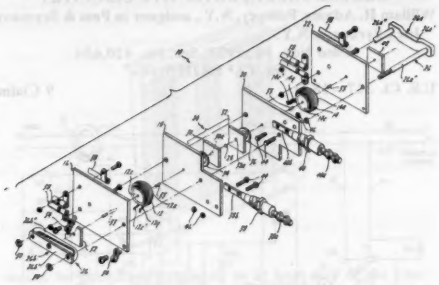
a gas vent provided adjacent the line voltage terminal end of said arrester for venting gases generated inside said arrester, said vent being directed toward, and in close proximity to, the inside surface of said metal enclosure.

3,936,704

MOUNTING ARRANGEMENT FOR ELECTRONIC SEMI-ONDUCTOR DEVICES

Daniel Andrew Brenneman, Kettering; Ramon Wright Ragan, Dayton, and Thomas Harry Brockie, West Carrollton, all of Ohio, assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 18, 1974, Ser. No. 524,601
Int. Cl.[2] H01L 23/12, 23/40
U.S. Cl. 317—118 14 Claims



1. In a mounting arrangement for electronic semi-conductor devices, the combination comprising:

a pair of electronic semi-conductor devices, each having a flat terminal surface, disposed with said flat terminal surfaces thereof facing each other;

a pair of electrical conductor members disposed between said pair of devices, each member having a flat surface disposed against the flat terminal surface of a corresponding one of said devices;

spacing means disposed between said members; and mounting means mounting said devices, said members and said spacing means including means applying a clamping force to hold said devices, said members and said spacing means together;

said spacing means including a pivotal connection between said conductor members permitting said members to relatively position themselves in response to application of said clamping force and maintaining said flat surface of each member against said flat terminal surface of the corresponding one of said devices,

said spacing means further including insulating means preventing current flow through said pivotal connection between said members.

3,936,705

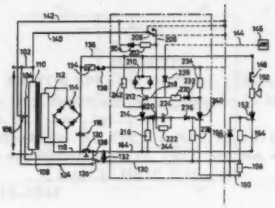
MONITOR CIRCUIT

Leo Jozef Maria Billion, 19, Rijkestraat, 3009-Winksele, Belgium

Division of Ser. No. 357,921, May 7, 1973, now Pat. No. 3,845,363. This application Aug. 20, 1974, Ser. No. 499,006
Int. Cl.[2] H01H 47/32
U.S. Cl. 317—136 4 Claims

1. Monitoring system comprising a number of signalizing circuits each comprising a first electronic switch, such as a thyristor, having a control electrode and associated with a signalling device which is to be activated by current flowing through it, all first thyristors being connected into parallel between two common lines of which the first one is connected to the first terminal of a direct current source and of which the second one is connected through a normally closed reset switch to the second terminal of this current source, a source of control voltage being provided for switching any one of the first thyristors from the non-conducting into the conducting state in response to the application of this voltage to its control electrode, said source being connected to the inputs of alarm switching elements each one of which, being coupled to the control electrode the first thyristor of a signalizing circuit and

through a capacitor to the control electrode of a second thyristor of this signalizing circuit, the respective second thyristors of the signalizing circuits being connected to a common parallel circuit, which second thyristor controls the state of



conductivity of a transistor or the like element associated with the first thyristor and with the signalling device and of which the conductivity is also controlled by the output signal of a source of alternating voltage.

3,936,706

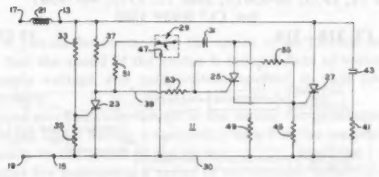
CONTROL CIRCUIT

David C. Hamstra, Clinton, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

Filed Sept. 18, 1974, Ser. No. 506,998

Int. Cl.² H03K *17/56*

U.S. Cl. 317—148.5 B **15 Claims**



1. A control circuit for supplying not more than one complete cycle of alternating current from a source thereof to a load upon command comprising a plurality of gate controlled switching devices each non-conducting until simultaneously properly poled and gated to thereafter conduct until the current therethrough decreases below a conduction threshold, a multiple state command switch, and an energy storage device for selectively accumulating energy during current excursions of one polarity and only when the command switch is in a first state, a first of the switching devices being connected in the circuit to begin conducting a short time interval after the beginning of each current excursion of the other polarity, a second of the switching devices being connected in the circuit in series between the source and the load for supplying electrical energy to the load when gated, a third of the switching devices being connected in the circuit to conduct when gated to deplete the store of energy in the storage device only when the command switch is in a second state, the conduction of the third switching device gating the second switching device, and gating of the third switching device occurring only during current excursions of the other polarity and when the first switching device is non-conducting.

3,936,707

OPERATING APPARATUS FOR ELECTRICALLY DRIVEN VEHICLES

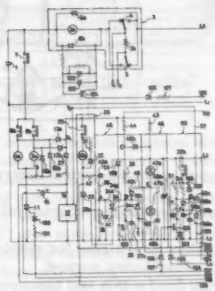
Susumu Yoshida, and Masaharu Suzuki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

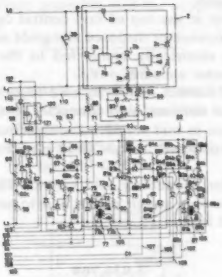
Filed Feb. 12, 1974, Ser. No. 441,809

Claims priority, application Japan, Feb. 14, 1973, 48-19356; Oct. 15, 1973, 48-115590; 48-115591; 48-115592; Nov. 29, 1973, 48-133732; 48-133733

Int. Cl.² H02P *5/06*

U.S. Cl. 318—139 **16 Claims**





1. An operating apparatus for an electrically driven vehicle having a main circuit wherein power is fed from a DC source to an electric motor, via a chopper voltage regulation circuit, the apparatus comprising:

a. an accelerator circuit including a variable resistor-transducer coupled to an accelerator pedal of said vehicle;

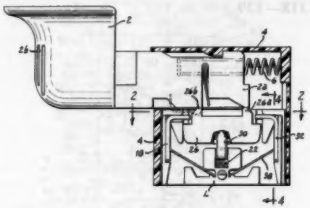
b. a signal generator including a control circuit for controlling said chopper circuit, and controlled by said variable resistor-transducer, for generating a gating signal for said chopper circuit, dependent on the instantaneous position of said accelerator pedal;

c. an overcurrent detector circuit controlling the current of said chopper circuit, by detecting the variation of voltage in accordance with the current of said main circuit, said overcurrent detector circuit comprising means for detecting the variation of voltage produced by the inductive resistance component which changes in response to the value of chopper current, and means for controlling the chopper current of said chopper circuit.

3,936,708
TRIGGER SPEED CONTROL SWITCH WITH PLASTIC PACK SEMI-CONDUCTOR

Merlin R. Dummer, Arab, Ala., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed July 9, 1974, Ser. No. 486,767
Int. Cl.² H02P 5/16
U.S. Cl. 318—249 **10 Claims**



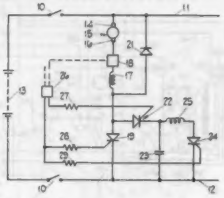
1. A double-pole, variable control trigger switch comprising:
- a return spring biased trigger adapted for operation by the forefinger of the user;
- a frame mounting said trigger for movement therein and having a base-embracing portion;
- a split base held fixed within said base-embracing portion of said frame with the tops of the base halves continguous to said trigger and defining therebetween a central compartment and defining with said frame left and right compartments;
- double-pole switch means with one pole thereof in each said left and right compartment and means for operating said switch poles by said trigger;
- and a semi-conductor variable control circuit in said central compartment comprising:
- a plastic pack semi-conductor element having cathode and gate terminals;
- a resistor strip at the top of said central compartment; an elongated connector disposed alongside said resistor strip and being electrically connected to the anode of said semiconductor element;
- an electrical contact driven by said trigger to slide along said resistor strip and said connector to vary the amount of resistance in said variable control circuit;
- a capacitor connected across said cathode and gate terminals;
- and means for connecting said variable control circuit to said double-pole switch means and to an electric power source and load.

3,936,709
CONTROL CIRCUITS FOR ELECTRICALLY DRIVEN VEHICLES

Maurice James Wright, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 14, 1974, Ser. No. 479,533
Claims priority, application United Kingdom, June 30, 1973, 31301/73
Int. Cl.² H02P 3/00
U.S. Cl. 318—269 **2 Claims**

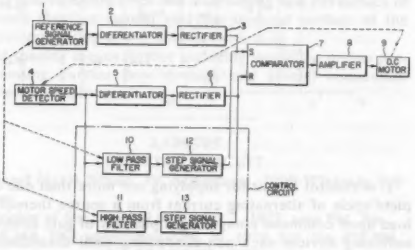
1. A control circuit for an electrically driven vehicle, comprising in combination a traction motor for driving the vehicle, an accelerator pedal which when depressed provides electrical drive and also determines the current in the motor armature, a brake pedal which when depressed provides electrical braking and also determines the current in the motor armature, contactors for selectively effecting said motor's armature-field connection, a thyristor chopper circuit controlling the operation of the motor, said chopper circuit including a main thyristor in series with the motor, a commutating capacitor for turning the main thyristor off, and a commutating thyristor controlling the commutating capacitor, a control unit which receives a signal representing the actual armature current and a signal from one of said pedals representing demanded armature current, the control unit providing gating pulses to the thyristors, in sequence in accordance with the actual and demanded current signals so as to control the armature current, and control means operable whenever the motor is switched from its forward drive to its forward braking condition and vice versa for reducing the demand signal fed to said control unit to a low value during changeover of said contactors effecting motor armature-field connection, and maintaining said demand signal at said low value for a predetermined time period initiated by said contactors closing to prevent incorrect firing of the thyristors due to contactor bounce.



3,936,710
SYNCHRONOUS DRIVE CONTROL SYSTEM FOR DC MOTOR

Kinji Tanikoshi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 5, 1974, Ser. No. 476,662
Claims priority, application Japan, June 4, 1973, 48-65614; June 11, 1973, 48-65615; June 11, 1973, 48-78587
Int. Cl.² H02P 5/00
U.S. Cl. 318—318 **19 Claims**



1. A DC motor and control system therefor comprising, in combination:
- a. a DC motor;
- b. motor-speed detecting means for detecting the rotational speed of said DC motor and generating an electrical signal having a frequency corresponding to the instantaneously changing rotational speed of said DC motor, said motor-speed detecting means being associatively arranged with said DC motor;
- c. means for generating a reference signal having a predetermined frequency in accordance with which said DC motor rotates at a predetermined constant speed;
- d. means for comparing said electrical signal and said reference signal to supply to said DC motor a potential corresponding to the phase difference of said signals; and

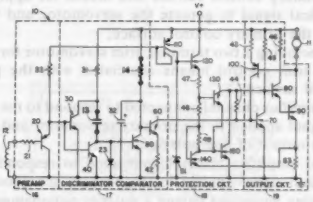
e. control means inserted between said motor-speed detecting means and said comparing means to form an auxiliary feed back loop, said control means being arranged to produce a control signal operative to disable said comparing means only when the electrical signal frequency exceeds said reference signal by a predetermined amount and to interrupt said supply of the potential corresponding to the phase difference of said signals to said DC motor.

3,936,711

MOTOR SPEED CONTROL CIRCUIT

Michael J. Gay, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 171,996, Aug. 16, 1971, abandoned. This application Sept. 28, 1973, Ser. No. 401,722
Int. Cl.[2] H02P 5/36, 5/06
U.S. Cl. 318—345 10 Claims



1. A circuit for controlling the speed of an electric motor such that the speed of the motor is independent of variations in supply voltage and temperature applied to said circuit, comprising:

means mechanically linked to the motor for generating an input signal having a frequency which varies proportionately to the speed of the motor;

means for generating a series of rectangular pulses of current, the magnitude of said current pulses being substantially constant with the number of said pulses generated over a predetermined time interval corresponding to the frequency of said input signal;

means for generating a reference current having a magnitude representing the desired speed of said motor and for subtracting said pulses of current from said reference current so as to develop an output current having an amplitude dependent on the difference of said pulses of current and said reference current, said pulse current and said reference current having similar dependencies on said supply voltage and temperature such that said output current is independent of the variations in the power supply voltage and temperature, said output current corresponding to the difference in the actual speed of the motor and the desired speed of the motor; and

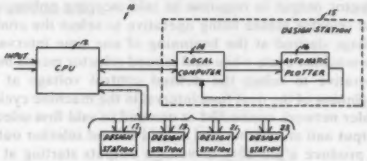
means responsive to said output current for generating voltage drive to the motor so as to control the speed of the motor, said voltage drive generating means including shunt feedback means being responsive to the voltage magnitude appearing across the motor for developing a negative feedback signal to ensure that a low impedance is presented in series with the motor and to stabilize the voltage drive to the motor.

3,936,712

INTERACTIVE GRAPHIC SYSTEM

Heinz Joseph Gerber, West Hartford; David J. Logan, Glastonbury, and Leonard G. Rich, West Hartford, all of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Continuation-in-part of Ser. No. 353,115, April 20, 1973, abandoned. This application July 9, 1973, Ser. No. 377,769
Int. Cl. G05b 19/42
U.S. Cl. 318—568 38 Claims



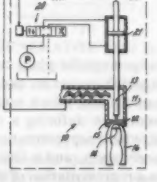
1. A computer controlled plotting system in which lines and symbols are automatically drawn on a drawing material in response to control signals, which drawing material resides upon a supporting surface of said plotting system, including a carriage assembly movable generally in a plane over said drawing material, said carriage assembly being capable of motion in two generally orthogonal coordinate directions in said plane and at least one writing instrument mounted on said carriage assembly for writing on said drawing material when said carriage is moved in response to said control signals, the improvement comprising: a cursor manually positionable over said drawing material for indicating the coordinate location of said cursor with respect to said supporting surface, said cursor being operably connected to said carriage assembly such that motion of said cursor with respect to said supporting surface generates said control signals which cause said carriage to move in response thereto, said cursor being mechanically suspended from said carriage assembly and having limited freedom of movement in the two coordinate directions relative to the carriage assembly and the support surface of the plotting system.

3,936,713

MACHINE CONTROL CIRCUIT

Denes B. Hunkar, Cincinnati, Ohio, assignor to Hunkar Laboratories, Inc., Cincinnati, Ohio

Filed Apr. 8, 1974, Ser. No. 458,470
Int. Cl.[2] G05B 19/24
U.S. Cl. 318—573 5 Claims



1. A circuit for analog control of a machine during its machine cycle, comprising, in combination:

timing pulse generator for producing a plurality of timing pulses at equally spaced time intervals during the machine cycle;

a counter responsive to said timing pulse to produce a stepping pulse after a predetermined number of timing pulses are counted;

a control voltage programmer for generating a plurality of control voltages, each said control voltage corresponding to the desired control voltage for the machine at the beginning of a defined time interval of the machine cycle;

a first selector means responsive to said control voltage programmer and said counter for sequentially placing each of said plurality of control voltages on the first selector output in response to said stepping pulses;

a second selector means responsive to said control voltage programmer and said counter for sequentially placing each of said plurality of control voltages on the second selector output in response to said stepping pulses, said first selector means being operative to select the control voltage desired at the beginning of one time interval in the machine cycle while said second selector means being operative to select the desired control voltage at the beginning of the next time interval in the machine cycle;

a ladder network connected at one end to said first selector output and at its other end to said second selector output to produce a plurality of voltage outputs starting at the voltage at said first selector output and ending at the voltage at the output of said second selector;

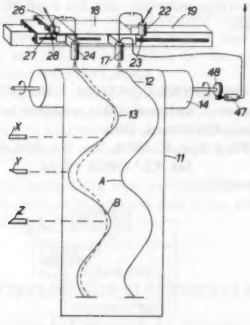
a third selector means responsive to said ladder network and said timing pulses for selectively connecting in sequence the plurality of voltages from said ladder network to the third selector output in response to said timing pulses, the output of the third selector means being a staircase voltage during each machine cycle interval.

3,936,714

PROFILING OF METALS

Victor Gregory Marshall, Gainsborough, and John Maurice Thompson, Waddingham, both of England, assignors to Redpath Dorman Long Limited, Bedford, England

Filed June 24, 1974, Ser. No. 482,657
Int. Cl.² G05B *19/36*
U.S. Cl. 318—576 **11 Claims**



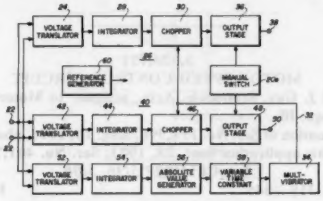
1. A control arrangement for plate cutting apparatus capable of making a cut which curves in, and is angled with respect to, the local plane of a plate, which arrangement comprises a programme representation defining a curve and relating an angle to that curve, which representation comprises two lines related to a common datum, and a first sensor device operatively responsive to a representation of the curve and a second sensor device operatively responsive to a representation of the corresponding angle, said sensor devices being operatively connected to send signals respectively capable of controlling relative translational movement between the plate and a cutting device such that a constant relative speed is maintained therebetween, and angular movement between the line of cut and the local plane of the plate, in accordance with said programme representation.

3,936,715

ELECTRONIC TRIM SYSTEM

John M. Nixon, Springdale, and James R. Younkin, Fayetteville, both of Ark., assignors to Edo-Aire Mitchell Industries, Inc., Mineral Wells, Tex.

Filed Aug. 9, 1974, Ser. No. 496,357
Int. Cl.² B64C *13/16*; G05D *1/00*
U.S. Cl. 318—580 **22 Claims**



1. An aircraft control system, comprising in combination:

an automatic pilot having a primary servo system for moving a primary control surface of an aircraft, the primary servo system including a primary servomotor coupled to the primary control surface and means for applying an electrical signal to actuate the servomotor and thereby move the primary control surface;

means including a two terminal, trim servomotor for actuating a trim control means associated with the primary control surface;

a first amplifier channel connected to respond to the electrical signal applied to the primary servomotor and providing an output of one polarity;

a second amplifier channel connected to respond to the electrical signal applied to the primary servomotor and providing an output having a polarity complementary to the output of the first amplifier channel; and

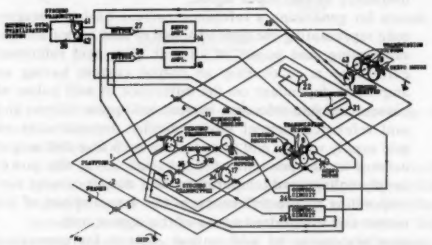
means for connecting the output of said first channel to one terminal of said trim servomotor and the output of the second channel to the second terminal of the trim servomotor.

3,936,716

STABILISATION SYSTEM

Johannes Bos, Hengelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 200,921, Nov. 22, 1971, abandoned.
This application Nov. 28, 1973, Ser. No. 419,684
Int. Cl.² G05B *7/00*
U.S. Cl. 318—591 **10 Claims**



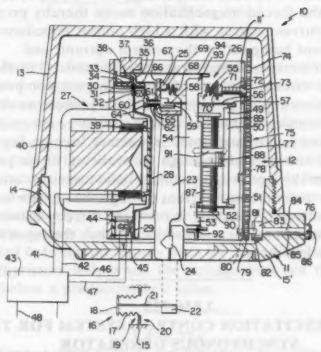
1. A stabilisation system for a naval radar installation whereby a gyro housing, which contains a vertical gyro in a cardanic suspension, is mounted on a platform to be stabilised, which is cardanically suspended by means of two concentric gimbal frames and stabilised about two corresponding co-planar orthogonal shafts, the stabilisation about each of said

shafts occurring by a servo system controlled by said gyro, wherein, in a first step, the spin axis of the vertical gyro is brought, to some extent, from a random orientation to a position vertical with respect to the earth surface by means of two synchro transmitters coupled to the gyro, first control circuits connected to each of these synchro transmitters, and two torque motors connected to a corresponding first control circuit, whereby each of said first control circuits is composed successively of a demodulator, a compensation network and a matching amplifier, and in a second step the vertical gyro is held in said vertical position in a known manner, by means of two accelerometers mounted on the platform to be stabilised, second control circuits connected to each of these accelerometers, and the above-mentioned torque motors, whereby each of said second control circuits is composed successively of a filter, the compensation network and the matching amplifier.

3,936,717
FORCE BALANCE TRANSMITTER AND PARTS THEREFOR OR THE LIKE

George T. Hardin, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 21, 1974, Ser. No. 499,319
Int. Cl.² G05B 1/06
U.S. Cl. 318—676 16 Claims

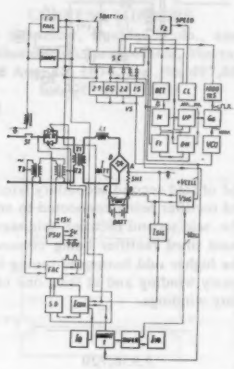


1. In a force balance transmitter having a frame means and a process element carried by said frame means and provided with a movable part adapted to move in response to changes in said process, said transmitter having feedback means carried by said frame means and having output signal means for producing a signal in relation to a feedback force thereof created to oppose movement of a movable feedback part thereof, the improvement comprising three levers pivotally mounted to said frame means transmitting motion of said movable part of said process element to said movable feedback part of said feedback means, said three levers comprising first, second and third levers respectively having opposed ends, said first lever having one end thereof interconnected to said movable part of said process element to be pivoted thereby, said second lever having one end thereof interconnected to the other end of said first lever, said third lever having one end thereof interconnected to the other end of said second lever and having the other end thereof interconnected to said movable feedback part of said feedback means, said three levers being arranged in substantially a parallel side-by-side relation with said third lever being disposed intermediate said first and second levers.

3,936,718
BATTERY CHARGING CONTROL CIRCUITS

William Gordon Melling; Peter George Mclellan, and Brian Turton Smith, all of London, England, assignors to Westinghouse Brake & Signal Company Limited, London, England

Continuation-in-part of Ser. No. 400,001, Sept. 24, 1973, Pat. No. 3,890,556. This application Oct. 16, 1974, Ser. No. 515,200
Claims priority, application United Kingdom, Sept. 25, 1974, 41820/74
Int. Cl.² H02J 7/10
U.S. Cl. 320—20 4 Claims



1. In a battery charging control circuit for controlling the charging of a battery in which gassing can occur at some stage during charging, said circuit being of the type wherein the state of battery charge is assessed by measurement when the battery charging current is interrupted and including timing means operated during an interruption to time a period of time, voltage register means responsive to the end of said period to register the battery voltage, comparison means to compare the registered battery voltage with the battery voltage registered earlier during a previous interruption of charging current, and comparison responsive control means responsive to the result of the comparison to permit, prevent or modify the charging current thereafter applied to the connected battery, the improvement wherein said comparison responsive control means includes means responsive to a minimum between decreasing and increasing differences between compared registered voltages indicative of the onset of a gassing phase of the charging of the battery to modify the charging current to a level appropriate to charging of the battery while the battery is gassing.

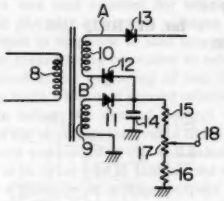
3,936,719
HIGH VOLTAGE GENERATOR FOR A TELEVISION RECEIVER

Keisuke Miyoshi, Katano, and Naoki Shibano, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 15, 1973, Ser. No. 416,119
Claims priority, application Japan, Nov. 20, 1972, 47-116936; Nov. 20, 1972, 47-116973; Nov. 20, 1972, 47-116974
Int. Cl.² H02M 3/22
U.S. Cl. 321—2 4 Claims

1. A high voltage generator for energizing a cathode ray tube of a television receiver comprising a high voltage transformer having a primary winding and first and second secondary windings; a first rectifier having one end connected to one end of said first secondary winding, the other end of said first

secondary winding being directly connected to ground, said first rectifier being connected in series with said first secondary winding; a second rectifier connected directly between the other end of said first rectifier and one end of said second secondary winding, the connection point between said first and second rectifiers forming a terminal for the derivation of a D.C. voltage; and a third rectifier having one end connected



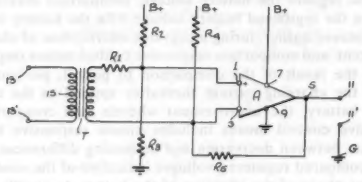
to the other end of said second secondary winding, the other end of said third rectifier being connected to an anode of said cathode ray tube, said second rectifier, said second secondary winding, and said third rectifier being connected in series, whereby fifth or higher odd harmonic tuning is obtained between said primary winding and at least one of said first and second secondary windings.

3,936,720

HALF-WAVE RECTIFIER CIRCUIT

Daniel R. von Recklinghausen, Arlington, Mass., assignor to Eastern Air Devices, Inc., Great Neck, N.Y.

Filed Aug. 12, 1974, Ser. No. 496,647
Int. Cl.² H02M 7/00
U.S. Cl. 321—8 R **6 Claims**



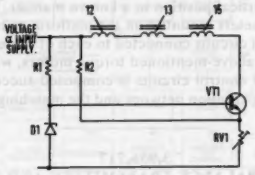
1. An improved half-wave rectifying circuit comprising the combination of:
- a differential amplifier having inverting input, noninverting input, output, supply voltage, and ground terminals;
- a voltage source;
- a negative feedback comprising a resistor R5 coupled between said output and inverting terminals;
- means to supply an offset current to said inverting input terminal comprising a resistor R4 coupling said voltage source to said inverting input terminal;
- means for supplying an operating bias to said noninverting input terminal comprising serially connected resistors R2 and R3 coupling said voltage source to the ground with the noninverting input terminal connected to the junction of the resistors R2 and R3; and
- said resistors R2, R3, R4 and R5 being proportioned to provide a substantially zero output compared to the ground terminal in the absence of an input signal.

3,936,721

ELECTRICAL POWER SUPPLIES

Michael Lord Butterworth, Bognor Regis, England, assignor to Weir Electronics Limited, Sussex, England

Filed Nov. 15, 1973, Ser. No. 415,931
Claims priority, application United Kingdom, Nov. 16, 1972, 52926/72
Int. Cl.² H02M 5/10
U.S. Cl. 321—25 **6 Claims**



1. An electrical power supply arranged to provide an alternating voltage output, said power supply comprising: an a.c. input source; a pair of transductors or saturable reactors having their output windings connected in phase opposition in series with the input source and the output; inverter means for supplying the input windings of the transductors with a constant d.c. control current independent of the output so as to operate in the forced magnetization mode thereby providing a constant current source with a high output impedance, the output current being set by the control current; and

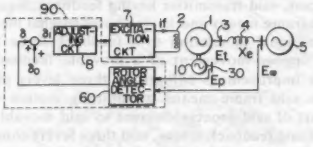
means for compensating "transfer admittance" in the d.c. control circuit, said compensating means comprising a transistor coupled in series with the transductors or reactors; a resistor in parallel with the series connected transistor and said transductors or reactors; means adapted to control the current through the resistor to be proportional to the input supply voltage, said transistor arranged so that the combined current through the resistor and the transductors or reactors is constant thereby causing the d.c. control current to be reduced when the input supply voltage increases.

3,936,722

FIELD EXCITATION CONTROL SYSTEM FOR THE SYNCHRONOUS GENERATOR

Masuo Goto, and Akira Isono, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 3, 1974, Ser. No. 457,506
Claims priority, application Japan, Apr. 4, 1973, 48-37773
Int. Cl.² H02P 9/14
U.S. Cl. 322—20 **6 Claims**



1. A field excitation control system of the synchronous generator comprising:
- a synchronous generator including a field winding;
- rotor angle detector means to detect the rotor angle of the synchronous generator;
- rotor angle setting means to provide a set value of the rotor angle;
- summing means to sum the output of said rotor angle detector means and the output of said rotor angle setting means;

phase regulating means for regulating the phase of the output of said summing means; and

field excitation voltage control means to control the terminal voltage of the field winding of the synchronous generator in response to the phase-regulated output of said summing means.

3,936,723

BATTERY CHARGING SYSTEMS FOR USE IN ROAD VEHICLES

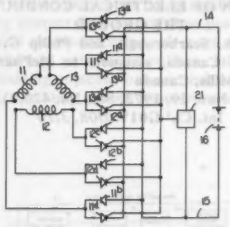
Paul Anthony Harris, Walsall, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed May 8, 1973, Ser. No. 358,321

Claims priority, application United Kingdom, May 20, 1972, 23833/72

Int. Cl.² H02P 9/26

U.S. Cl. 322—28 1 Claim



1. A battery charging system comprising in combination a permanent magnet alternator having at least three separate single phase windings, positive and negative supply lines for connection to a vehicle battery, and a plurality of pairs of diodes and pairs of thyristors, there being one pair of diodes and one pair of thyristors for each winding, and each winding having its ends connected to the negative supply line through its pair of diodes respectively, and its ends further connected to the positive supply line through its pair of thyristors respectively, the system further including voltage sensitive means connected between the supply lines for providing gate current to the thyristors only when the voltage between the supply lines is below a predetermined value.

3,936,724

AUTOMATIC VOLTAGE REGULATOR FOR A SEPARATELY EXCITED GENERATOR

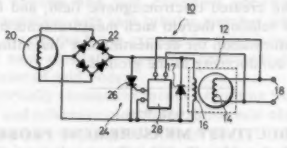
Yoshihiko Ikeda, Susono, Japan, assignor to Kokusan Denki Co., Ltd., Shizuoka, Japan

Filed Feb. 13, 1975, Ser. No. 549,705

Claims priority, application Japan, Feb. 19, 1974, 49-20057[U]

Int. Cl.² H02P 9/26

U.S. Cl. 322—28 5 Claims



1. An automatic voltage regulator for a separately excited generator comprising a main AC generator including an armature winding and an exciting winding and an exciter of an AC magento generator associated with said exciting winding of said main AC generator, said regulator comprising a single controlled semiconductor switching device disposed in parallel to said exciting winding of said main AC generator; an output voltage detecting and control signal generating circuit having the input connected to the output of said armature winding to detect the output voltage of said main AC generator and having the output connected to a controlled electrode of said controlled semiconductor switching device to apply a control signal to said controlled electrode when the output voltage of said main AC generator reaches more than a predetermined value; and the exciting output voltage from said AC magneto generator having frequency much higher than that of the output voltage of said main AC generator.

3,936,725

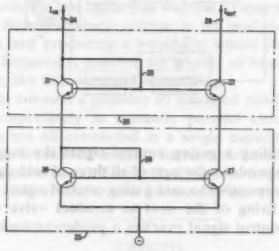
CURRENT MIRRORS

Herbert Anton Schneider, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 15, 1974, Ser. No. 497,687

Int. Cl.² G05F 3/08

U.S. Cl. 323—1 7 Claims



1. In combination,

a first current mirror and a second current mirror, each of said current mirrors comprising first and second transistors, means for interconnecting the bases of said first and second transistors and means connected to the collector of said first transistor for providing base current for said first and second transistors, and

cascode means for connecting said first and second current mirrors in a cascode configuration, said cascode means comprising means for coupling the emitter of each of said first and second transistors of said first current mirror to the collector of a respective one of said first and second transistors of said second current mirror.

3,936,726

GATING CONTROL FOR A STATIC SWITCHING ARRANGEMENT WITH IMPROVED DYNAMIC RESPONSE

Fred W. Kelley, Jr., Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Sept. 3, 1974, Ser. No. 503,143

Int. Cl.² G05F 1/56

U.S. Cl. 323—24 8 Claims

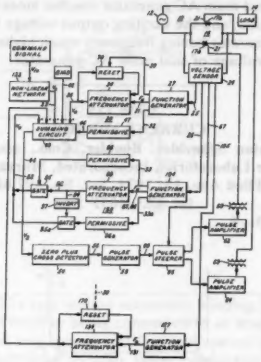
1. A gating control for a complementary pair of alternately conducting controllable electric valves which are cyclically fired at gating angles that can be varied to control the subsequent conduction angel of each valve in turn, said gating control comprising:

a. first means for supplying a control signal having a magnitude indicative of the conduction angles desired for said valves;

b. second means for developing an on-time indicating signal having a magnitude during each of the intermittent intervals when neither valve is conducting that is proportional to the actual conduction angle of the last conducting valve;

c. third means for developing an off-time indicating signal that varies in magnitude as a function of the duration of each of said intermittent non-conducting intervals;

d. summing means connected to said first, second, and third means and effective during each non-conducting interval



for providing a gating control signal the magnitude of which depends on the sum of all three of said signals; and

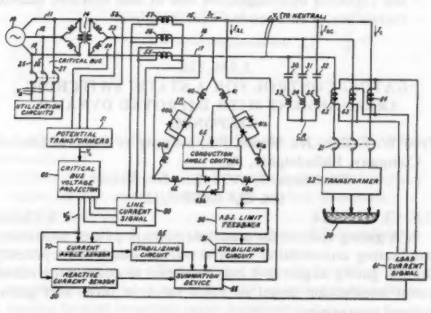
e. means responsive to said gating control signal for initiating the firing of the next to conduct valve when said gating control signal reaches a predetermined threshold level.

3,936,727

HIGH SPEED CONTROL OF REACTIVE POWER FOR VOLTAGE STABILIZATION IN ELECTRIC POWER SYSTEMS

Fred W. Kelley, Jr., Media, Pa., and Georges R. E. Lezan, Cherry Hill, N.J., assignors to General Electric Company, Philadelphia, Pa.

Filed Oct. 12, 1973, Ser. No. 406,139
Int. Cl.² G05F *1/68*
U.S. Cl. 323—102 **24 Claims**



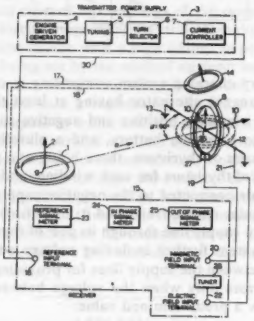
1. Reactive current compensating apparatus for a multiphase alternating current electric power circuit having load terminals and supply conductors and subject to varying reactive current demand at said load terminals comprising, fixed multiphase capacitor means connected in said power circuit, fixed multiphase inductor means, alternating current static switching means connected in series with each phase of said inductor means, means connecting the series combination of said inductor means and switching means in parallel circuit relation with said capacitor means, each said switching means including gating means for varying the conduction angle of said switching means thereby to control the magnitude of reactive current traversing one phase of said inductor means, means for generating a group of individual signals representative in each half cycle of power circuit frequency of the reactive component of current in each phase of an electrical load connected to said load terminals, and means individually responsive to each said signal for so controlling said gating means in the associated phase that the net effective reactive impedance of said fixed capacitor means and said fixed inductor means in each phase is substantially equal and opposite to reactive current demand at the load terminal of each phase.

3,936,728

METHOD AND MEANS FOR INVESTIGATING THE DISTRIBUTION OF ELECTRICAL CONDUCTIVITY IN THE GROUND

Mrinal K. Ghosh, Scarborough, and Philip G. Hallof, Don Mills, both of Canada, assignors to McPhar Geophysics Limited, Don Mills, Canada

Filed Nov. 29, 1973, Ser. No. 420,019
Int. Cl.² G01V *3/08, 3/10*
U.S. Cl. 324—6 **15 Claims**



1. A method of investigating the distribution of electrical conductivity in the ground for the purpose of delineating geophysical structures comprising creating an electromagnetic field at a transmitting point and measuring at a receiving point at a finite distance from said transmitter point at a series of frequencies within the frequency range of from about 5 cycles per second to about 43,000 cycles per second one or more of the magnetic induction field and the electric induction field components created by said electromagnetic field measured both in phase and out of phase with a reference signal derived electromagnetically, adjacent the receiving point, from the created electromagnetic field, and having a random phase relation thereto such measurements providing a source of information for delineating any discontinuities in the electrical conductivity in the ground.

3,936,729

CONDUCTIVITY MEASUREMENT PROBE

Joseph D. Winslow, Jr., Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 28, 1974, Ser. No. 446,854
Int. Cl.² G01N *27/42*
U.S. Cl. 324—30 B **10 Claims**

1. A conductivity probe comprising:

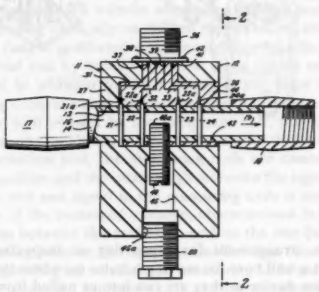
a. a body formed of a rigid insulating material and having a cylindrical opening therethrough;

b. a tubular electrically nonconducting member positioned coaxially within said opening of said body with an annulus therebetween extending at least partially through said body and said tubular member forming a cylindrical flow passage within said body thereby providing an insulated boundary defining a flux channel to polarization current;

c. said tubular member extending beyond the exterior surface of said body and carrying end connections adapted to function as inlet and outlet means for passing aqueous liquid through said flow passage;

d. four metallic electrodes of elongated configuration disposed in the flow passage and mounted with at least one of their ends penetrating the wall of said tubular member within said annulus between said body and said tubular member, and said electrodes positioned in parallel relationship with their longitudinal axes transverse to said flow passage and residing in a plane containing the longitudinal axis of said flow passage;

e. one pair of said electrodes being auxiliary electrodes for providing current flow in said flow passage and another pair of said electrodes being reference electrodes serving as polarization potential monitors, said auxiliary electrodes residing adjacent one another and said reference electrodes residing remote from one another at the limits



of said flux channel and adjacent each auxiliary electrode;

f. each of said reference electrodes spaced equidistantly from the adjacent auxiliary electrode, and said auxiliary electrodes spaced apart a greater distance from one another than said auxiliary electrodes from said reference electrodes;

g. an elongated opening provided in said body intersecting said annulus and said elongated opening disposed in juxtaposition with said tubular member with one end of said electrodes being exposed by said elongated opening, and said elongated opening communicating with the exterior of said body;

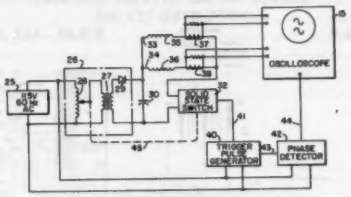
h. electrically conductive means extending from said auxiliary and reference electrodes within said elongated opening to the exterior of said body; and

i. a cast insulating material filling void-free said annulus and elongated opening for integrally securing said tubular member, electrodes, electrically conductive means and body into a fluid-tight and rigid relationship, and said cast insulating material insulating said conductive means from each other in said body whereby said conductive means form circuits through said electrodes during conductivity measurements.

3,936,730
INSULATION TEST APPARATUS INCLUDING IMPROVED MEANS FOR SIMULTANEOUS DISPLAY

Paul F. Pittman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1971, Ser. No. 146,233
Int. Cl.² G01R 31/14
U.S. Cl. 324—54 **7 Claims**



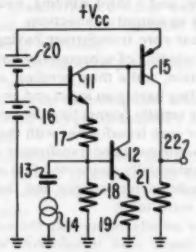
1. In insulation test apparatus wherein a capacitor discharge applies a high frequency voltage to an insulated conductor under test and producing a waveform whose characteristics, including frequency, indicate the quality of insulation on the conductor, the improvement comprising:

means to connect a plurality of insulated conductors under test respectively in mutually parallel circuit branches which are all connected in a single capacitor discharge circuit; means for sensing current variations in each of said parallel circuit branches; means for displaying signals from each of said means for sensing current variations.

3,936,731
AMPLIFIER WITH FAST RECOVERY AFTER INPUT SIGNAL OVERSWING

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 14, 1974, Ser. No. 523,742
Int. Cl.² H03F 3/68
U.S. Cl. 330—17 **23 Claims**



23. In combination:

a driver transistor of one conductivity type having base, emitter and collector electrodes, adapted to receive an input signal between its base and emitter electrodes;

an amplifier including a second transistor of opposite conductivity to said driver transistor, having base, emitter and collector electrodes and direct coupled at its base electrode to the collector electrode of said driver transistor, said second transistor exhibiting a capacitance at its base electrode which tends to discharge when said driver transistor cuts off and tends to drive said second transistor to cut-off; and

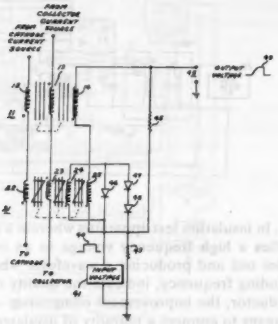
means coupled to an electrode of said driver transistor for sensing the approach the cut-off in said driver transistor and responding to supply a charging current to said capacitance.

3,936,732

TRAVELING WAVE TUBE BODY CURRENT SENSOR

Victor J. Modiano, Anaheim, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 31, 1974, Ser. No. 537,791
Int. Cl.[2] H03F 3/58
U.S. Cl. 330—43 2 Claims



1. A traveling wave tube body current sensor for serially connecting between the cathode of the traveling wave tube and the cathode current power source and serially connecting between the collector of the traveling wave tube and the collector current power source, providing an output voltage proportional to the said body current, the said sensor comprising:

a. a linear core transformer having a first winding and a second winding of substantially unity turns ratio wound in opposition, and a third winding; each winding having an input and an output connection;

b. a nonlinear core transformer having a first winding and a second winding of substantially unity turns ratio wound in opposition, and a third winding, and a fourth winding, each winding having an input and an output connection;

c. means for serially connecting the said first winding of the said linear core transformer with the said first winding of the said nonlinear core transformer and serially connecting the said serially connected first windings between the said cathode current source and the said cathode of the traveling wave tube;

d. means for serially connecting the said second winding of the said linear core transformer with the said second winding of the said nonlinear core transformer and serially connecting the said serially connected second windings between the said collector current source and the said collector of the traveling wave tube;

e. a pulse generator providing a constant pulse voltage;

f. means including a first resistance for applying the said pulse voltage to the said third winding of the said nonlinear core transformer through the said first resistance;

g. means for serially connecting the said third winding of the said linear core transformer with the said fourth winding of the said nonlinear core transformer;

h. a second resistance connected across the said serially connected third and fourth windings;

i. means for connecting the said first resistance to the said second resistance; and

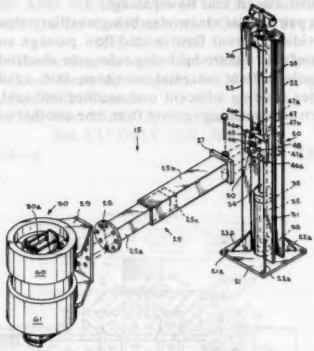
j. means for providing an output connection across the said connected first and the said second resistance.

3,936,733

APPARATUS FOR SUPPORTING AN INSPECTION DEVICE FOR TUBULAR MEMBERS AND ACCOMMODATING LATERAL SHIFTING OF THE TUBULAR MEMBERS AS THEY ARE RUN INTO OR PULLED FROM A WELL BORE

Derwin R. Clary, Odessa, Tex., assignor to Trip Inspectors, Inc., Odessa, Tex.

Continuation-in-part of Ser. No. 431,093, Jan. 7, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 533,322
Int. Cl.[2] G01R 33/12
U.S. Cl. 324—37 9 Claims



1. An arrangement for supporting an inspection device adjacent a well bore for moving tubular members through the inspection device as they are run into or pulled from the well bore including:

a. an upwardly extending support for positioning adjacent a well bore;

b. laterally extending arm means secured to said upwardly extending support and being normally positioned, during operation, at a given angular disposition with respect thereto;

c. a single pivot means between said upwardly extending support and said laterally extending arm means for allowing, at all times, free pivotal movement of said arm means with respect to said support and about a single axis in either angular direction away from said normal position;

d. said arm means comprising two members in telescoping relationship and arranged to accommodate, at all times, free axial sliding of one member with respect to the other in directions of both extension and retraction;

e. bearing means between said two members to facilitate said free axial sliding and to guide and support said members;

f. a device for inspecting tubular members, said inspection device surrounding a central aperture defined by said inspection device and through which tubular members may pass, said inspection device being carried by said arm means; whereby said telescoping members of said arm and said pivot means allow free movement of said inspection device within a plane of limited bounds to accommodate lateral shifting of tubular members as they are run into or pulled from the well bore without affecting operation of the inspection device.

3,936,734

METHOD FOR CONTACTLESS MEASUREMENT OF CONDUCTIVITY AND/OR TEMPERATURE ON METALS BY MEANS OF EDDY CURRENTS

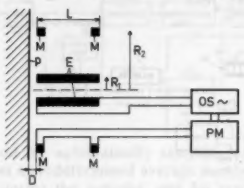
Gerold Brandli, Windisch, and Pierre Keller, Baden, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 21, 1975, Ser. No. 542,774

Claims priority, application Switzerland, Feb. 6, 1974, 1617/74

Int. Cl.² G01R 33/12

U.S. Cl. 324—40 3 Claims



1. A method for contactless measurement of conductivity and/or temperature on metals by means of eddy currents, whereby with the aid of a measuring head including thereon an excitation coil fed with an alternating current and having its axis standing vertically on the test specimen, an alternating magnetic field is generated which penetrates into the surface of the metal and by inductive means gives rise to eddy currents, and in addition to the excitation coil there are two measuring coils of equal radius arranged coaxially and symmetrically with respect to the excitation coil, the length of each measuring coil being substantially smaller than the length of the excitation coil, the measuring coils are connected in series opposition and the phase angle between the signal in the excitation coil and signal in the measuring coils is used as an indication of the measured variable, characterized in that the radius ratio between the excitation coil on the one hand, and the measuring coils on the other, is smaller than ¼ or greater than 4, depending on whether the measuring coils are located outside or insdie the excitation coil, and the distance between the measuring head and the specimen surface is adjusted until the said phase angle between the excitation-coil signal and the measuring-coil signal exhibits a maximum.

3,936,735

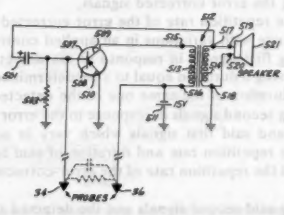
CIRCUIT HAVING AUDIO OUTPUT PULSE RATE RELATED TO MEASURED RESISTANCE AND OUTPUT PULSE MODULATION RELATED TO MEASURED CAPACITANCE

Bjorn N. deBough, 8011 First Ave. N.E., Seattle, Wash. 98115

Filed Apr. 15, 1974, Ser. No. 460,712

Int. Cl.² G01R 27/00

U.S. Cl. 324—57 R 19 Claims



16. The method of claim 15 wherein said step of simultaneously generating electrical signals representative of said measured resistance and capacitance comprises generating periodic audio pulses having a repetition rate which is a function of the measured resistance and a pitch which is a function of the measured capacitance.

3,936,736

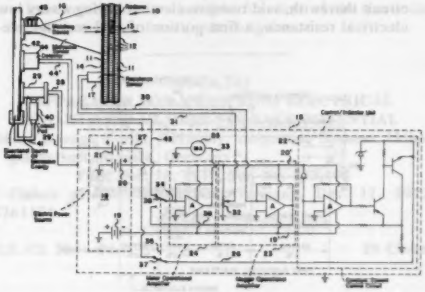
RADOME TEST INSTRUMENT

N. Reece Ray, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Aug. 28, 1974, Ser. No. 501,038

Int. Cl.² G01R 27/04

U.S. Cl. 324—58.5 R 9 Claims



1. A test instrument for radomes of multilayer sandwich construction designed to pass a prescribed frequency and having an outer surface covered with a coating of electrically conductive paint adapted to bleed-off static charges thereon comprising:

a microwave sensor adapted to be placed against the surface of a radome wall;

a first electrical circuit including said microwave sensor, a source of microwave energy, a matching device to adjust the impedance of said microwave sensor to a predetermined value, a detector, a directional control for the flow of energy from said microwave energy source to said microwave sensor and the flow of reflected energy from said radome wall to said detector corresponding to variations from said predetermined value and an indicator connected to said detector and operable in response to the reflected energy aforesaid;

a resistance sensor adapted to be placed against said outer surface of said radome wall;

a second electrical circuit including said resistance sensor, a source of electrical energy, an amplifier and the indicator aforesaid; and

a selector switch common to said first and second electrical circuits and operative to connect one of said circuits to, and concurrently disconnect the other of said circuits from, said indicator.

3,936,737

CORROSION MONITORING SYSTEM

Fitch B. Jefferies, Sr., Springfield, N.J., assignor to C.M.S. Inc., Springfield, N.J.

Filed Apr. 10, 1975, Ser. No. 566,832

Int. Cl.² G01R 27/02

U.S. Cl. 324—65 CR 15 Claims

1. Apparatus for measuring corrosion of an electrically conductive material in a corrosive medium, said apparatus including probe means in combination with bridge circuit means, said probe means comprising:

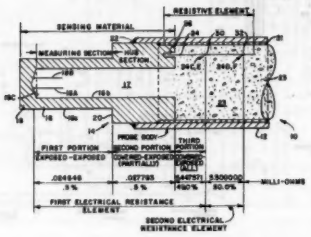
a closed end corrosion measuring portion made from such conductive material and adapted for insertion into said corrosive medium, said measuring portion being a first portion of a first electrical resistance element in said bridge circuit means, said measuring portion having a relatively low resistance, said measuring portion being

subjected to fluctuation of temperatures in said corrosive medium;

a hub portion adjoining said measuring portion and in electrical circuit therewith, said hub portion being formed from such conductive material and having a relatively thick wall compared to said measuring portion, and further having a very low resistance, said hub portion being a second portion of a first electrical resistance element in said bridge circuit means, said hub portion being subjected to temperature variations in said corrosive medium;

a body portion adjoining said hub portion;

a resistive element within said probe means and in electrical circuit therewith, said resistive element having a very low electrical resistance, a first portion of said resistive element being a third portion of a first electrical resistance element;



first circuit means and second circuit means for defining a second portion of said resistive element as a second electrical resistance element in said bridge circuit means;

additional circuit means connected to at least some of said first and second electrical resistance elements to provide electrical connections to said bridge circuit means;

a source of electrical potential in said bridge circuit means for energizing said electrical resistance elements simultaneously, said bridge circuit including means for measuring the output voltage due to an imbalance in said bridge circuit means thereby to measure changes in the electrical resistance of the first portion of the first electrical resistance element to indicate the corrosion of said measuring portion.

3,936,738

METHOD OF AND APPARATUS FOR MEASURING THE AMOUNT OF COATING MATERIAL APPLIED TO SUBSTRATES

Frederick L. Maltby, Jenkintown, Pa., assignor to Drexelbrook Controls, Inc., Glenside, Pa.

Filed Jan. 2, 1974, Ser. No. 429,743

Int. Cl.² G01N 27/00; G01R 27/02

U.S. Cl. 324—71 R **9 Claims**

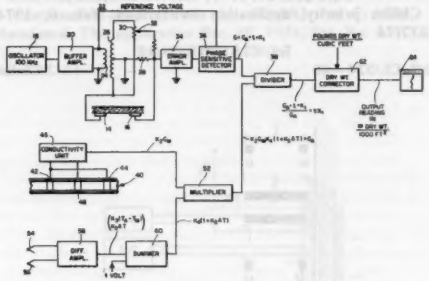
1. Apparatus for determining the thickness of a coating on a substrate comprising:

conductivity measuring means for generating a signal representing the conductivity of the coating material at a temperature before application to the substrate;

temperature sensing means for generating a signal representing the difference in the temperature of said coating material before application to said substrate and the temperature of the coating on the substrate;

conductance measuring means for generating a signal representing the overall conductance of the coating material on the substrate at the actual temperature of the coating material on the substrate; and

circuit means coupled to said conductivity measuring means, said temperature sensing means and said conductance measuring means for generating a signal representing the thickness of the coating material in response to



said conductivity signal, said temperature difference signal and said conductance signal.

3,936,739

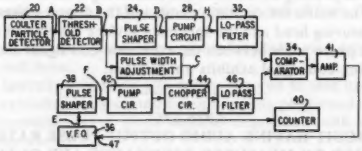
METHOD AND APPARATUS FOR GENERATING ERROR CORRECTED SIGNALS

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Feb. 12, 1974, Ser. No. 441,752

Int. Cl.² G01N 27/00; G01G 7/12

U.S. Cl. 324—71 CP **32 Claims**



1. A method for generating error corrected signals in response to detected signals which are subject to error due to coincidence including the steps of:

generating the error corrected signals,

varying the repetition rate of the error corrected signals in accordance with variations in an applied control signal,

developing first signals in response to the detected signals each having a duration equal to a predetermined function of the duration of the same one of the detected signals,

developing second signals in response to the error corrected signals and said first signals which vary in accordance with the repetition rate and duration of said second signals and the repetition rate of the error-corrected signals, and

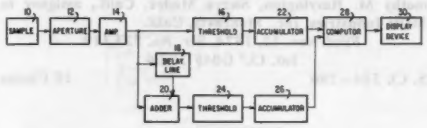
comparing said second signals and the detected signals and developing said control signal, said control signal varying in accordance with variations between said second signals and the repetition rate of said detected signals.

3,936,740

METHOD AND APPARATUS FOR AUTOMATICALLY SAMPLING PULSES A PREDETERMINED AVERAGE NUMBER OF TIMES FOR STORAGE AND SUBSEQUENT REPRODUCTION

Walter R. Hogg, Miami Lakes, and Wallace H. Coulter, Miami Springs, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Feb. 13, 1974, Ser. No. 442,110
Int. Cl.² G01N 27/00; H03K 5/20
U.S. Cl. 324—71 CP 30 Claims



1. A method for automatically sampling each pulse in a series of pulses a predetermined average number of times, for sequentially storing the samples, and for reproducing each pulse in the series, delayed in time, including the steps of:

detecting the duration of at least a portion of each pulse in the series,

developing first signals having a variable repetition rate,

varying the repetition rate of the first signals for developing a predetermined average number of first signals during said detected duration of each pulse,

sampling each pulse in the series in response to said first signals,

storing said samples for a period of time in response to said first signals.

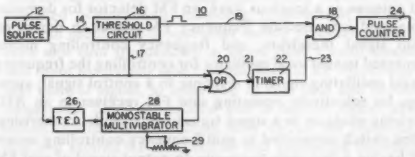
22. In a particle study device which develops particle pulses in response to detection of particles and counts said particle pulses, and which includes error correction circuitry for providing a particle count of particle pulses corrected for detection and counting errors, the improvement comprising, delay circuit means for automatically sampling each particle pulse a predetermined average number of times, for sequentially storing the samples, and for reproducing each pulse from said samples delayed in time.

3,936,741

METHOD AND APPARATUS FOR PROVIDING PRIMARY COINCIDENCE CORRECTION DURING PARTICLE ANALYSIS UTILIZING TIME GENERATION TECHNIQUES

Wallace H. Coulter, Miami Springs; Walter R. Hogg, Miami Lakes; Edward Neal Doty, Pompano; Millard D. Longman, North Miami, and Stephen Campbell, Hialeah, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 407,235, Oct. 17, 1973, abandoned. This application July 2, 1974, Ser. No. 485,160
Int. Cl.² G01N 27/00; H03K 5/20
U.S. Cl. 324—71 CP 25 Claims



1. A method for correcting a particle pulse count subject to coincidence error including the steps of:

counting the particle pulses received for a predetermined period of time,

increasing said predetermined period of time by a time increment that is a function of the pulse width of the pulses counted.

11. An apparatus for automatically correcting a particle pulse count subject to coincidence error wherein the particle pulses are developed in response to passage of particles in a particulate system through a particle sensing device, said apparatus including in combination,

timer means operative to count the particle pulses for a predetermined period of time, and

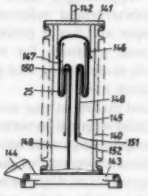
control means coupled to said timer means and operative to increase said predetermined period of time by a time increment in response to each particle pulse, said time increment duration being a function of the particular characteristics of each particle pulse.

3,936,742

APPARATUS FOR MEASURING ELECTRICAL QUANTITIES AT HIGH-VOLTAGE POTENTIAL

Dieter Krause, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 10, 1973, Ser. No. 423,172
Claims priority, application Germany, Dec. 11, 1972, 2261151
Int. Cl.² G01R 31/00, 19/00
U.S. Cl. 324—96 29 Claims



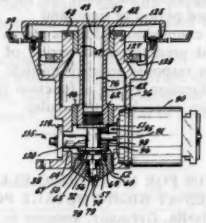
1. A measuring apparatus for measuring voltages on high-voltage conductors whereat fields are developed having an intensity indicative of the value of the high-voltage, the apparatus comprising: a sensing coil for conducting polarized light therein, said sensing coil being made from a wound light-wave conductor having respective ends; a single light-wave conductor for receiving polarized light having a polarization and for feeding the same to said sensing coil at one of said ends thereof; said sensing coil being placeable in the vicinity of the fields whereby the polarization of the polarized light is changed by an amount corresponding to the value of the voltage being measured; reflection means disposed at the other one of said ends of said sensing coil away from said single light-wave conductor for reflecting the polarized light fed to said sensing coil whereby the polarized light of changed polarization passes through said single light-wave conductor; evaluation means for translating the changed polarization into a quantity proportional to the electrical quantity being measured; an optical device arranged ahead of said single light-wave conductor for feeding the polarized light to said single light-wave conductor and for directing said polarized light of changed polarization from said single light-wave conductor to said evaluation means; and, an uncontrolled high-voltage insulator defining an axis, said sensing coil defining a longitudinal axis, said coil being arranged in said insulator so that the axis of said coil extends in the direction of the axis of said insulator, said high-voltage insulator comprising a plurality of control electrodes imbedded therein, said control electrodes being spaced one adjacent the other so as to define a region between each two mutually adjacent ones of said control electrodes, said coil being arranged in said regions.

3,936,743

HIGH SPEED PRECISION CHUCK ASSEMBLY

Jacques L. Roch, San Jose, Calif., assignor to Electroglas, Inc., Menlo Park, Calif.

Filed Mar. 5, 1974, Ser. No. 448,370
Int. Cl.² G01R 31/02; B23Q 1/14
U.S. Cl. 324—158 F 10 Claims



1. In a system for testing and grading integrated circuit components wherein a wafer containing multiple circuit components is supported on a platform which is indexed in an X–Y coordinate and then moved vertically to a test position wherein one or more probe assemblies test preselected portions of the circuit components, the improvement comprising;

platform means for supporting a wafer and movable vertically along a predetermined reference axis between a predetermined upper and lower position,

means supporting said platform for rotation about said reference axis while maintaining said platform perpendicular to said reference axis,

means including spool means at one end thereof mounting said platform for said vertical movement,

eccentric means cooperating with said spool means for effecting said vertical movement of said mounting means,

motor means driving said eccentric means, and

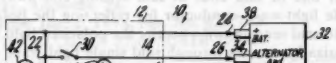
said motor means cooperating with said eccentric to provide a sinusoidal speed characteristic to said platform after reaching a maximum speed and decelerating said platform sinusoidally as said platform approaches said predetermined upper position.

3,936,744

AUTOMOTIVE ALTERNATOR AND SOLID STATE REGULATOR TESTER

David Perlmutter, 98 Harrison Ave., Island Park, N.Y. 11558

Filed Apr. 30, 1974, Ser. No. 465,600
Int. Cl.² G01R 15/12, 31/02
U.S. Cl. 324—158 R 10 Claims



1. A tester for a solid state voltage regulator and/or associated alternator having two outputs, comprising:

first and second circuit branches; said first circuit branch including, in parallel combination, resistance means and indicator light bulb means continuously connected in said first circuit;

first terminal means adapted to be interconnected to a battery source;

second and third output terminal means adapted to interconnect respectively to said regulator output contacts;

one end of said first and second circuit branches being interconnected and the interconnection coupled to said first terminal means;

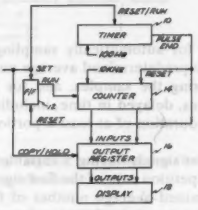
the other ends of said first and second circuit branches respectively being simultaneously coupled to said second and third output terminal means, and normally open switch means serially interconnected only in said second circuit branch.

3,936,745

METHOD OF MEASURING THE DURATION OF A DISCONTINUOUS SIGNAL

Timothy M. Harrington, Sierra Madre, Calif., assignor to MDH Industries, Inc., Monrovia, Calif.

Filed Nov. 12, 1974, Ser. No. 523,119
Int. Cl.² G04F 10/00
U.S. Cl. 324—186 10 Claims



1. For use in an electrical circuit, a method of measuring the duration of a discontinuous signal, which consists of groups of pulses with the duration of the gap between individual pulses in the same group being smaller than the time between groups, comprising the steps of:

a. starting the operation of a time-measuring device at the time of arrival of the leading edge of the first pulse in the pulse group whose duration is to be measured;

b. copying the measured value from the time-measuring device, without stopping the time-measuring device, at the time of arrival of the trailing edge of the first pulse in the pulse group whose duration is to be measured; and

c. storing the copied measured value from the time-measuring device during gaps in the discontinuous signal.

3,936,746

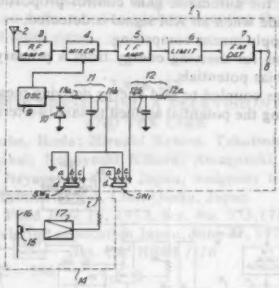
FM RECEIVER HAVING TRANSMITTING FUNCTION

Osamu Irie, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 8, 1974, Ser. No. 486,314
Claims priority, application Japan, July 31, 1973, 48-90492[U]
Int. Cl.² H04B 1/44
U.S. Cl. 325—20 4 Claims

1. In an FM receiver having an antenna; a local oscillator for supplying an oscillating signal to a mixer coupled to said antenna for producing an intermediate frequency FM signal, a leakage portion of said oscillating signal being radiated from said antenna as a spurious wave; an FM detector for demodulating said intermediate frequency FM signal to derive an audio signal therefrom; and frequency controlling means connected to said local oscillator for controlling the frequency of said oscillating signal in response to a control signal; apparatus for selectively operating said FM receiver in an AFC receiving mode or in a signal transmission mode, comprising: a first switch connected to said frequency controlling means and having a first state to couple an output signal of said FM detector to said frequency controlling means as said control signal therefor and a second state to couple a source of audio signals to said frequency controlling means as said control signal therefor to thereby produce a frequency modulated

oscillating signal for transmission; a second switch operable independently of said first switch and having a first state to permit said control signals to be applied to said frequency

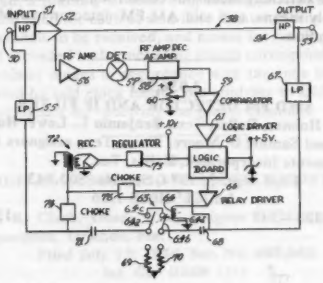


controlling means and a second state to prevent said control signals from being applied to said frequency controlling means; and a low pass filter for transmitting said control signals to said frequency controlling means.

3,936,747
CODE OPERATED SWITCHING DEVICE FOR COMMUNICATIONS SYSTEMS AND THE LIKE

David S. McVoy, Sarasota, Fla., assignor to Coaxial Scientific Corporation, Sarasota, Fla.

Filed July 5, 1973, Ser. No. 376,386
Int. Cl.[2] H04B 1/06; H02B 1/00; H04B 1/00, 1/16
U.S. Cl. 325—30 16 Claims

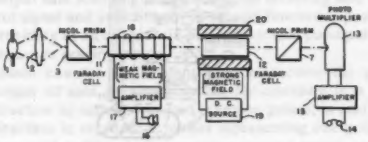


1. In a communication system for sending and receiving data, the combination including: a plurality of data transmitting means each being represented bby a predetermined discrete interrogation code, code interrogation means for generating a discrete code signal corresponding to a selected one of the interrogation codes and representing a particular one of said data transmitting means, code operated switch means coupled to each of said data transmitting means, each code operated switch means including, input means for receiving first and second RF frequencies having predetermined difference and sum frequencies, a single filter circuit coupled to said input for passing said first and second RF frequencies and said control signal, at least one of said first and second RF frequencies being modulated with a control signal, detector means coupled to said single filter circuit for receiving said first and second RF frequencies and producing therefrom an intermediate frequency which includes said control signal, normally open circuit means coupled to said detector means and operative in response to said control signal, and data retrieval means coupled to said code operated switch means to receive data signals from the discrete data transmitting means which has been interrogated when said normally open circuit means is closed.

3,936,748
SECRET COMMUNICATION SYSTEM EMPLOYING MAGNETIC CONTROL OF SIGNAL MODULATION ON MICROWAVE OR OTHER ELECTROMAGNETIC CARRIER WAVE

Hans A. Bomke, Sea Girt, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 10, 1956, Ser. No. 610,445
Int. Cl.[2] H04K 1/00; H04B 9/00
U.S. Cl. 325—32 10 Claims



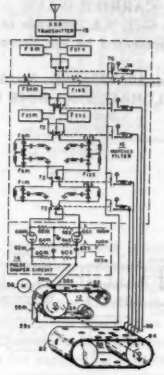
1. A system for transmitting varying amplitude signals with a high degree of secrecy over a wave transmission medium, including a source of polarized electromagnetic waves of predetermined wavelength at the input to said medium, three transmission devices each adapted for transmitting electromagnetic waves in a given direction, and including a substance having a resonance spectrum with a strong, sharp absorption line therein including said predetermined wavelength within its frequency limits, and exhibiting strong anomalous dispersion in the immediate neighborhood of said line, a first and a second one of said devices being located at the input to said medium and the third being located at the output of said medium, means to apply an electromagnetic wave from said source to said first device in said given direction, means simultaneously to apply to said first device in the direction of wave propagation a weak magnetic field varying in accordance with the amplitude of the signals to be transmitted, in order to produce rotation effects in the applied wave proportional to the instantaneous signal amplitudes, representing signal modulation, means to apply the resulting modulated wave to the second of said devices in said given direction, means simultaneously to apply to said second device in the direction of wave propagation a strong magnetic field of such strength as effectively to cause the removal from the modulated wave in transmission through that device of the rotation effects representing signal modulation, and thus to render the signals carried by that wave secret to a high degree before the wave is transmitted over said medium, means at the output of said medium to apply the received wave to said third device in said given direction, means simultaneously to apply to said third device in the direction of wave propagation a strong magnetic field of the same strength as that applied to said second device but reversed in direction with respect thereto to reinsert effectively in the applied wave in transmission through said third device the rotation effects representing signal modulation removed by said second device, means to convert the rotation effects in the resulting wave into proportional amplitude modulation and means to detect the signals from the resulting amplitude modulated wave.

3,936,749

MATCHED FILTER COMMUNICATION SYSTEMS

Ernst A. Guillemin, Wellesley, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 23, 1961, Ser. No. 120,146
Int. Cl.² G01R 33/12
U.S. Cl. 325—42 5 Claims



1. In a wideband matched filter communication system or transmitting digital information identified by initial sharp pulses from a transmitter thru a communication channel to a receiver, a filter network comprising a multiplicity of filter sections of differing phase-frequency characteristics all in series, the overall characteristic of the entire multiplicity of sections being linear, said sections being distributed between a group at said transmitter and another group at said receiver, the overall characteristics of the sections in each group being non-linear, whereby the various frequency components of the initial sharp pulse are differently delayed in the transmitter group to decrease the amplitude of the pulse signal by spreading its energy over a substantial time period and also differently delayed in the receiver group, but in a complementary manner, to restore the pulse in the receiver at a predetermined time delay due to the operation of the filter.

3,936,750

AM-FM RECEIVER HAVING IMPROVED BIAS SUPPLY CIRCUIT

William Peil, North Syracuse, and Robert J. McFadyen, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation-in-part of Ser. No. 435,456, Jan. 22, 1974, abandoned. This application Jan. 20, 1975, Ser. No. 542,623
Int. Cl.² H04B 1/06
U.S. Cl. 325—315 20 Claims

1. In a superheterodyne radio receiver in the integrated circuit format, the combination comprising:

a. a tuner for converting received AM and FM signals to two predetermined intermediate frequencies, an FM portion of said tuner having a first terminal for connection to a source of d.c. bias potentials and having a local oscillator energized through said terminal, tunable by bias voltage adjustment,

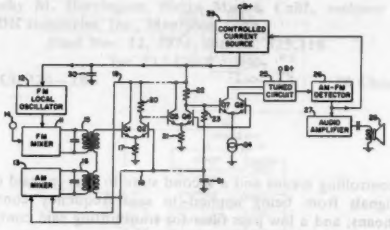
b. an intermediate frequency amplifier for said two intermediate frequency signals energized through a second terminal for connection to a source of d.c. bias potentials, said amplifier comprising at least one stage of amplification, said amplification being subject to control by bias variation, increasing with increased bias,

c. an AM-FM detector for said intermediate frequency signals for producing a d.c. voltage for automatic frequency control proportional to the error in center tuning when an FM signal is detected and for producing a d.c. voltage for automatic gain control proportional to the amplitude when an AM signal is detected,

d. bias supply means comprising:

1. means for deriving energy from a primary source of d.c. bias potentials,

2. means coupled to said energy deriving means for controlling the potential applied to said two terminals, said



control means having a first control for establishing a lower average bias for AM operation and a higher average bias for FM operation and a second control responsive to said detector output for controlling said bias about said averages as a function of detector output,

e. capacitive means coupled to said terminals to provide filtering action for automatic frequency control and automatic gain control, and

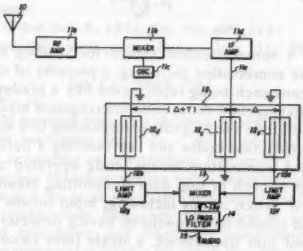
f. mode switching means for converting said tuner, said bias supply means, and said AM-FM detector to AM or FM operation.

3,936,751

SWD FM DETECTOR AND IF FILTER

Jerry D. Holmes, Dallas, Tex.; Benjamin L. Lowe, Huntsville, Ala., and Samuel D. Moore, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 5, 1974, Ser. No. 503,943
Int. Cl.² H04B 1/16
U.S. Cl. 325—347 13 Claims



1. In a radio receiver, the combination comprising:

a. an SWD structure providing two channels each with an input section and an output section, said channels having different spacing between their input and output sections respectively such that predetermined different delays are imposed on modulated signals passing through said channels,

b. a mixer,

c. means to apply a modulated input signal to said input sections of said SWD structure, and

d. means to receive output signals from each of said output sections and to apply said output signals from said two channels to said mixer to produce at the output of said mixer an audio output signal representing the modulation of said input signal.

3,936,752

DEVICE FOR PRESETTING A TELEVISION PROGRAM AND THE LIKE

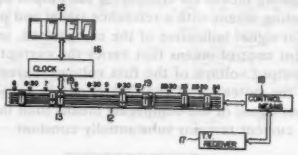
Kaoru Sasabe, Ikeda; Hiroaki Kotera, Takatsuki; Toshihide Hane, Sakai; Nobuyoshi Kihara, Amagasaki, and Masao Takebe, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 25, 1973, Ser. No. 373,171

Claims priority, application Japan, June 27, 1972, 47-64594

Int. Cl.² H04B *1/16*

U.S. Cl. 325—396 7 Claims



1. A device for presetting a television program or the like, comprising clock means for generating time information, a program board provided with a plurality of time pointer means the positions of which are optionally changed respectively to designate the times at which a television receiver is to be operated, a plurality of recording means provided separately from and each for each of said time pointer means for presetting channels to be received, and means for reading the information recorded in the recording means corresponding to said time pointer means in accordance with the time information generated by said clock means and applying to said television receiver signals for receiving the preset channels.

3,936,753

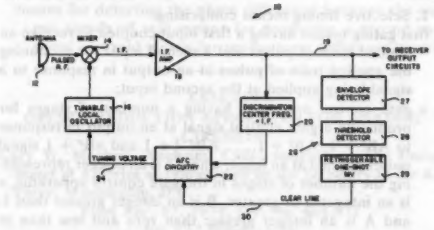
DIGITAL AUTOMATIC FREQUENCY CONTROL CIRCUIT

Ronald R. Clark, Ocoee, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed July 12, 1974, Ser. No. 488,083

Int. Cl.² H04B *1/32*

U.S. Cl. 325—420 4 Claims



1. In a scanning type of superheterodyne radio receiver having a local oscillator, a mixer, and an intermediate frequency amplifier, a digital automatic frequency control circuit having a search mode and a lock mode for causing such receiver to automatically lock onto a received pulsed radio frequency signal falling within the scanning range of the receiver while rejecting the image frequency of such signal, said digital automatic frequency control circuit comprising:

a discriminator connected to the output of said intermediate frequency amplifier and having a center frequency equal to the intermediate frequency and providing a pulse output signal of one polarity and, after passing through zero, of the opposite polarity as the receiver scan approaches and then passes the received signal,

pulse polarity sequence sensing means connected to the output of said discriminator actuated only by a predetermined polarity sequence of pulses from said discriminator for generating a control signal in response to a first polarity when followed by a certain number of pulses of a second polarity,

a source of scanning pulses,

switching means connected to receive and be operated by said control signal and having first and second functional positions, said switching means receiving as switched inputs said source of scanning pulses and pulses representing one polarity and the opposite polarity from said pulse polarity sequence sensing means, said switching means when in its first functional position providing as an output said scanning pulses and upon receiving said control signal and switching to its second functional position providing as an output said pulses from said pulse polarity sequence sensing means,

up-down counter means connected to receive the pulse output of said switching means for counting in a first direction in response to said scanning pulses, in said first direction in response to pulses representing one polarity from said pulse polarity sequence sensing means, and in a second direction in response to pulses representing the opposite polarity from said pulse polarity sequence sensing means, and

digital-to-analog converter means connected to said up-down counter means for generating an incrementally variable tuning voltage for said local oscillator proportional to the count stored in said up-down counter means.

3,936,754

DEVICE FOR DETECTING THE OPENING OF THROTTLE VALVE OF DIESEL ENGINE FOR VEHICLE

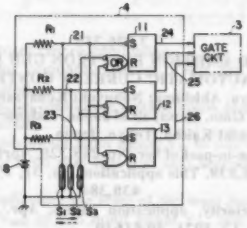
Teruo Minami, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed June 5, 1974, Ser. No. 476,728

Claims priority, application Japan, Nov. 21, 1973, 48-130129

Int. Cl.² G01H *27/00*; H01H *9/00*

U.S. Cl. 328—1 4 Claims



1. A device for detecting the opening of a throttle valve of a diesel engine, said device comprising a housing; a magnetic means positioned within said housing; a plurality of switch means positioned within said housing; magnetic shield means positioned between said magnetic means and said plurality of switch means, said magnetic shield means having a gap therein such that a said magnetic means operates one of said plurality of switch means corresponding to the position of said gap, and wherein the position of said gap is a function of the position

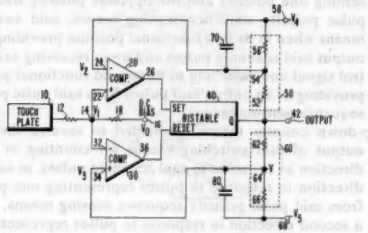
of said throttle valve; and a plurality of bistable circuit means, each bistable circuit means having a set input coupled to a corresponding one of said switch means and a reset input coupled to all of the others of said switch means, wherein the operation of one of said switch means sets the corresponding bistable circuit means and resets all of the other bistable circuit means, whereby the position of said throttle valve produces a corresponding output in said bistable circuit means.

3,936,755

PROXIMITY SWITCH CIRCUIT

Abel Ching Nam Sheng, Morris Plains, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 19, 1974, Ser. No. 490,010
Int. Cl.[2] G08B 13/26
U.S. Cl. 328—5 7 Claims



1. The combination of:
input means normally at a given quiescent bias level V_x and responsive to the proximity of an object for producing an alternating output signal of amplitude V_y;
two variable threshold circuits connected to said input means, one at an initial threshold setting closer to V_x than V_y and the other at an initial threshold setting further from V_x than V_y; and
circuit means responsive to the actuation of said one threshold circuit in response to said alternating output signal for changing the threshold of said one threshold circuit to a new threshold setting further from V_x than V_y and for changing the threshold of said other threshold circuit to a new threshold setting closer to V_x than V_y, and responsive to subsequent actuation of said other threshold circuit for returning said two threshold circuits to their initial threshold settings.

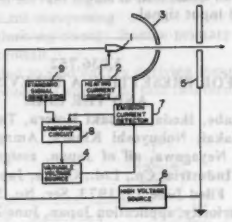
3,936,756

FIELD EMISSION ELECTRON GUN HAVING AUTOMATIC CURRENT CONTROL

Teruo Someya, Akishima; Nobuyuki Kobayashi, Kodaira, and Toshinori Goto, Fussa, all of Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 245,328, April 19, 1972, Pat. No. 3,825,839. This application Jan. 31, 1974, Ser. No. 438,384
Claims priority, application Japan, Apr. 30, 1971, 46-28753; July 12, 1971, 46-51610
Int. Cl.[2] H02H 7/20
U.S. Cl. 328—9 4 Claims

1. A field emission type electron gun comprising:
an emitter for emitting an electron beam,
a first anode for generating a strong electric field at said emitter,
a first voltage source for generating a potential difference between said first anode and said emitter,
a second anode located behind the first anode maintained at ground potential,
a second high voltage source for supplying negative high potential to said emitter for accelerating said electron beam, a detecting means for detecting the electron beam emitted from said emitter and providing an output signal indicative of the electron beam fluctuation,



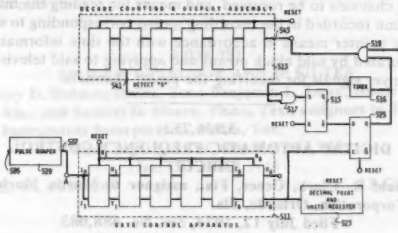
a comparing means for comparing the output signal of said detecting means with a reference signal and providing an output signal indicative of the comparison, and
a current control means that varies the current by varying the output voltage of the first voltage source and therefore the potential of the first anode in response to the output signal of the comparing means such that the electron current remains substantially constant.

3,936,757

AUTOMATIC GATE CONTROL SYSTEM

Ian T. Band, Los Altos, and Kenneth J. MacLeod, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 17, 1974, Ser. No. 515,730
Int. Cl.[2] H03K 17/00, 3/66
U.S. Cl. 328—72 3 Claims

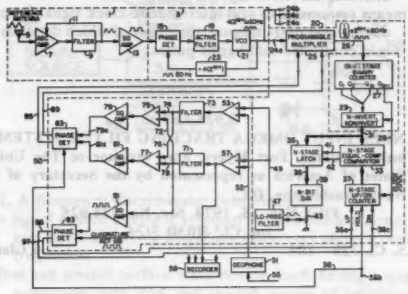


1. Selective timing means comprising:
first gating means having a first input coupled to receive an applied train of pulses and a second input for producing the applied train of pulses at an output in response to a signal being applied at the second input;
a gate control apparatus having a number of stages for producing a gate control signal at an output in response to $AB^0 + 1$, $AB^1 + 1 \ldots AB^{x-1} + 1$ and $nB^x + 1$ signal pulses applied at an input, where x is an integer representing the number of stages in the gate control apparatus, n is an integer 0 or greater, B is an integer greater than 1, and A is an integer greater than zero and less than or equal to $B - 1$;
timing means responsive to a signal being applied at the second input of the first gating means for producing a timing signal; and
logic means coupled to receive the timing signal and the gate control signal for applying a signal at the second input of the first gating means is response to said timing signal and said gate control signal.

3,936,758
PHASE DIFFERENCE DETECTOR

Richard J. Kostelnicek; Curtis B. Herbert, Jr., both of Houston, Tex., and Thomas H. Crawford, Dhahran, Saudi Arabia, assignors to Exxon Production Research Company, Houston, Tex.

Division of Ser. No. 421,384, Dec. 3, 1973, Pat. No. 3,889,229. This application Mar. 20, 1975, Ser. No. 560,067
Int. Cl.² H03B 3/04
U.S. Cl. 328—133 1 Claim



1. Apparatus for detecting the phase difference between a first substantially monochromatic sinusoidal electrical signal and a second substantially monochromatic sinusoidal signal having substantially the same frequency as said first substantially monochromatic signal that is a component of a composite electrical signal which may contain other signals, which comprises:

means for producing a residual signal equal to the difference between said composite signal and said first substantially monochromatic signal;

means for producing a first sum signal equal to the sum of said composite signal and said first substantially monochromatic signal;

first filtering means for filtering from said residual signal all frequency components not of substantially the frequency of said first substantially monochromatic signal;

second filtering means having a transfer function substantially equal to the transfer function of said first filtering means for filtering said first sum signal;

means for producing a second sum signal indicative of the sum of the filtered first sum signal and the filtered residual signal;

means for producing a difference signal indicative of the difference between the filtered first sum signal and the filtered residual signal; and

means for detecting the phase difference between the output signals of said means for producing a second sum signal and said means for producing a difference signal.

3,936,759
OFFSET REDUCTION APPARATUS FOR ANALOG CIRCUITS

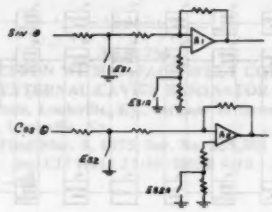
Gary W. Macheel, Anaheim, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 17, 1974, Ser. No. 461,671
Int. Cl.² H04B 15/00
U.S. Cl. 328—162 8 Claims

1. An offset reduction apparatus for analog circuits comprising in combination:

means for forcing the input of an analog circuit to zero, the output of said analog circuit being the DC offset of said analog circuit, said analog circuit receiving input signals, said analog circuit having a negative input terminal, said analog circuit providing an error signal in response to said input signals, said error signal being an output signal and said DC offset, and

means for storing and subtracting said DC offset connected to said output of said analog circuit, said storing and substracting means storing said DC offset from said analog circuit, said storing and substracting means substracting said DC offset from said error signal, a compensation

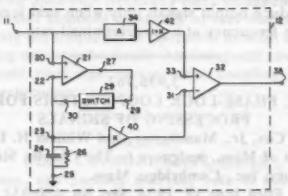


network connected between said negative input terminal and ground, said compensation network providing a constant DC output from said analog circuit during normal and correction circuit operation, said compensation network comprising a pair of resistors connected in series and a switch connected from the junction of said resistors to ground.

3,936,760
D.C. RESTORER CIRCUIT

Robert Rosen, Granada Hills, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 460,317, April 12, 1974, Pat. No. 3,890,545. This application Jan. 14, 1975, Ser. No. 541,037
Int. Cl.² H03B 3/02
U.S. Cl. 328—162 8 Claims



4. A d.c. restorer circuit comprising:

first means for comparing voltage levels and having two input terminals;

second means for comparing voltage levels and having two input terminals;

means for applying an input signal V_{in} to one of the input terminals of both said first and said second comparing means;

means for duplicating the level of the most negative-going excursion V_{neg} of said input signal V_{in}, said duplicating means being connected to the other input terminal of both said first and said second comparing means; and

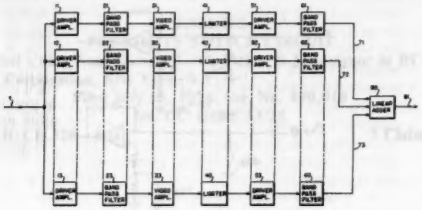
feedback means for providing a feedback path from the output of said first comparing means to the input of said first comparing means to which said duplicating means is connected, said feedback means opening and closing its feedback path in accordance with the output voltage from said first comparing means,

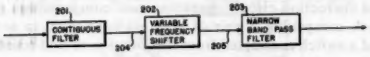
wherein the output from said second comparing means is proportional to the resultant of the input signal V_{in} and a d.c. level.

3,936,761
PLURAL CHANNEL FILTER

Garold K. Jensen, Alexandria, Va., and James E. McGeogh, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 27, 1967, Ser. No. 649,795
Int. Cl.[2] H04B *1/10, 15/00*
U.S. Cl. 328—167 **10 Claims**





1. An arrangement for discriminating against narrow bandwidth signals and in favor of desired varying frequency signals wherein all of said signals occur in a predetermined frequency bandwidth, said arrangement comprising:

a plurality of channels having incremental bandwidths which are dimensioned in frequency to cover in their aggregate said predetermined bandwidth, said channels responsive to said signals to limit the amplitude of said signals to produce first signals;

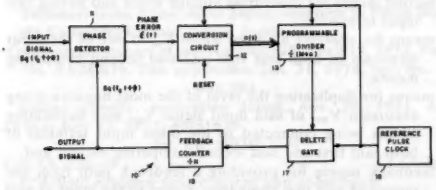
means for vectorially adding said first signals to derive second signals and;

varying frequency means to receive said second signals and to produce output signals only when said second signals vary in frequency at a predetermined rate.

3,936,762
DIGITAL PHASE-LOCK LOOP SYSTEMS FOR PHASE PROCESSING OF SIGNALS

Duncan B. Cox, Jr., Manchester, and William H. Lee, Arlington, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed June 17, 1974, Ser. No. 480,032
Int. Cl.[2] H04L *27/14*; H03C *3/24*
U.S. Cl. 329—104 **25 Claims**



1. A phase processing system comprising means responsive to an input signal having a first phase and further responsive to an output signal having a second phase for producing an error signal representing the phase difference between said first and second phases;

means for producing a reference clock signal having a fixed clock frequency;

means responsive to said clock signal and to said error signal for converting said error signal to a digital signal having a value representing said error signal;

means responsive to said clock signal and to said digital signal for producing a pulse control signal having a frequency which varies in accordance with the time-varying value of said digital signal;

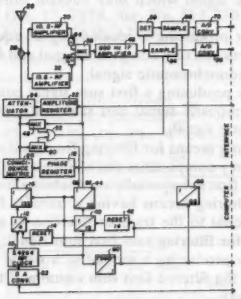
means responsive to said pulse control signal and to said reference pulse clock signal for controllably changing the number of pulses from said reference pulse clock signal in response to said pulse control signal to produce an intermediate clock signal;

means responsive to said intermediate clock signal for producing said output signal, the phase of which depends on said controlled number of pulses.

3,936,763
NULL INPUT OMEGA TRACKING FILTER SYSTEM

Winslow Palmer, Fort Myers, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 15, 1974, Ser. No. 524,025
Int. Cl.[2] H03D *3/24*
U.S. Cl. 329—104 **6 Claims**



1. Tracking filter apparatus for determining the relative phase of synchronized CW navigation systems comprising:

input terminal means for receiving remote signals whose phase is to be determined;

first signal generating means for generating a sinusoidal signal having a phase and magnitude to that of the fundamental component of received signal;

a difference circuit coupled to said input terminal and said first signal generating means and having an output that is proportional to the phasor difference of its inputs;

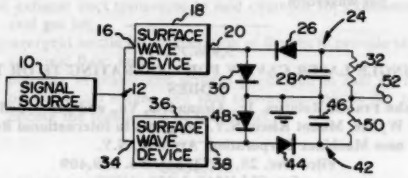
phase register means coupled to said first signal generating means for providing a signal that has a value that causes the fundamental component of said signal generated by said first signal generating means to match the phase of the corresponding incoming signal component and is a measure of the phase difference of the incoming signal.

3,936,764

FREQUENCY DISCRIMINATOR UTILIZING SURFACE WAVE DEVICES

Martin Fischman; G. Norman Williams, both of Seneca Falls, N.Y., and Jean M. Van Noppen, Kessel-Lo, Belgium, assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 21, 1974, Ser. No. 516,174
Int. Cl.² H03H 9/26; H03D 3/26
U.S. Cl. 329—117 8 Claims



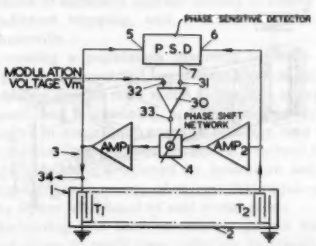
1. A frequency discriminator comprising:
a signal source having a terminal for providing a signal at said terminal having frequencies that vary about a center frequency;
first and second surface wave devices each having a single transducer with first and second combs of interleaved electrodes disposed on a piezoelectric substrate, said first and second surface wave devices having impedance maximums at frequencies lower and higher, respectively, than said center frequency;
first and second envelope detectors;
means connecting said first comb of electrodes of said first and second surface wave devices to said terminal of said signal source and further connecting said second comb of electrodes of said first and second surface wave devices to said first and second envelope detectors, respectively, for providing first and second output signals; and
means connected to said first and second envelope detectors for summing said first and second output signals to provide a signal having an amplitude representative of the frequency deviation of the signal provided by said signal source from said center frequency.

3,936,765

SURFACE ACOUSTIC WAVE OSCILLATORS

Meirion Francis Lewis, and James Dennis Maines, both of Malvern, England, assignors to National Research Development Corporation, London, England

Filed June 4, 1974, Ser. No. 476,275
Claims priority, application United Kingdom, June 6, 1973, 27095; May 3, 1974, 19653
Int. Cl.² H03B 3/04, 5/30
U.S. Cl. 331—1 R 11 Claims



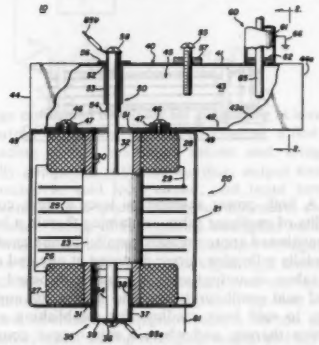
1. An acoustic wave oscillator comprising a surface acoustic wave delay line having an input transducer and an output transducer mounted on a substrate capable of supporting acoustic waves, an amplifier circuit having its input connected to the output of the output transducer, and its output connected to the input of the input transducer a phase sensitive detector for measuring the phase difference between signals received from two transducers mounted on the substrate and giving an output dependent on said phase difference, and means controlled by the phase sensitive detector for applying to the amplifier circuit a correcting signal to maintain a desired phase difference measured by the phase sensitive detector.

3,936,766

MAGNETRON WITH CAPACITIVELY COUPLED EXTERNAL CAVITY RESONATOR

James E. Staats, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 5, 1975, Ser. No. 555,391
Int. Cl.² H01J 25/50; H03B 9/10
U.S. Cl. 331—88 13 Claims



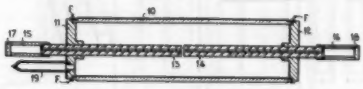
1. In combination, a crossed-field electron discharge device for generating ultra-high frequency electromagnetic energy, a cavity resonator disposed externally of said discharge device for stabilizing the frequency of operation thereof, and capacitive coupling means galvanically insulating said cavity resonator from said discharge device while coupling microwave energy therebetween.

3,936,767

COLD CATHODE GAS LASERS

André Besson, and Jacques Becrelle, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 18, 1973, Ser. No. 361,605
Claims priority, application France, May 24, 1972, 72.18488
Int. Cl.² H01S 3/22, 3/03
U.S. Cl. 331—94.5 D 4 Claims



1. A cold cathode gas laser of the coaxial type comprising: a cylindrical aluminium tube cathode; at least one insulating capillary tube coaxially disposed in said cathode; end plates coupled to said cathode, at least one of which for receiving said capillary tube for fixedly positioning said tube, one extremity of said capillary tube extending beyond the end of said tube cathode; said capillary tube having an opening to provide an open path between the interior of said capillary tube and

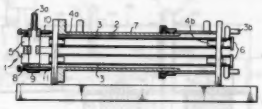
the interior of said cylindrical aluminium tube forming said cathode; at least one cylindrical anode fixed at said one extremity of said capillary tube; two semi-reflective mirrors terminating a path which includes the interior of said at least one capillary tube for constituting an optical resonant cavity; means for sealing said cathode, said at least one capillary tube, said end plates, said at least one anode and said two semi-reflective mirrors and forming a gas-tight enclosure (i.e. the interior of said cathode and the interior of said optical resonant cavity); and said tight enclosure being filled with a laser gas mixture.

3,936,768

MOLECULAR GAS LASER DEVICE WITH AN IMPROVED OUTPUT MIRROR MEANS

Akira Ichinose, and Norio Karube, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 5, 1973, Ser. No. 376,825
Claims priority, application Japan, July 5, 1972, 47-67729
Int. Cl.² H01S *3/08*
U.S. Cl. 331—94.5 C 4 Claims



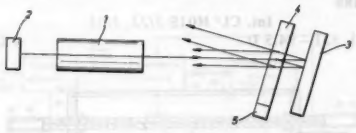
1. A high power multibeam laser system comprising: a plurality of oscillator tubes containing therein a laser medium and positioned approximately parallel to one another, at least one totally reflecting mirror disposed at one end of said oscillator tubes, an output coupling mirror disposed at the other end of said oscillator tubes, and means for applying pump energy to said laser medium for establishing a population inversion therein, and wherein said output coupling mirror comprises plural segmented mirror elements having at least the inner faces which face said oscillator tubes lying in a single flat plane.

3,936,769

ACOUSTO-OPTICALLY Q-SWITCHED LASER WITH MODULATED OUTPUT

Michiel de Wit, Dallas, and Roddy Fro Hotz, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,319
Int. Cl.² H01S *3/10*
U.S. Cl. 331—94.5 M 3 Claims



1. A method of modulating the output of an acousto-optically Q-switched laser including a lasing means and two reflectors, with an acousto-optic Q-switch between said lasing means and one of said reflectors, said method comprising:

transmitting a light beam as the output from the lasing means toward the Q-switch and said one reflector,

activating said Q-switch by introducing acoustic energy thereinto having a frequency approximately equal to the frequency difference between adjacent longitudinal modes of the light beam output or a multiple or submultiple thereof as the light beam output passes through the Q-switch,

feeding back at least a portion of the light beam output by said one reflector, and

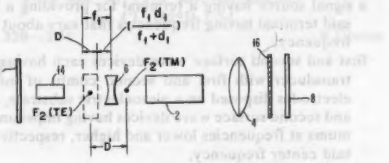
modulating the light beam output as a consequence of said Q-switch activation as it is fed back by said one reflector by shifting the frequency of the feedback light beam in an amount equal to the frequency difference between adjacent longitudinal lasing modes or a multiple or submultiple thereof to produce a resultant modulated lasing output waveform.

3,936,770

SINGLE LASER CAVITY FOR GENERATING TE OR TM MODES

John Francis Reintjes, Jr., Alexandria, Va., and James Jeffrey Wynne, Mount Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,409
Int. Cl.² H01S *3/082, 3/098*
U.S. Cl. 331—94.5 C 8 Claims



1. A laser cavity generator for generating either the rotationally symmetric TE or TM mode comprising

two light reflectors facing each other to form the outer boundaries of an optical resonant cavity,

a laser medium in said cavity adjacent one of said reflectors,

a convex lens and a concave lens located between said laser medium and said other light reflector,

a birefringent material inserted between said lenses,

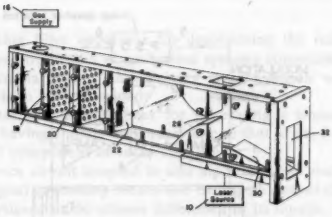
and means for varying the optical thickness between said lenses for alternatively generating the TE mode or the TM mode.

3,936,771

SUBSONIC FLOW AERODYNAMIC WINDOW FOR HIGH ENERGY LASER

James M. Kallis, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 27, 1974, Ser. No. 455,437
Int. Cl.² H01S *3/05*
U.S. Cl. 331—94.5 C 2 Claims



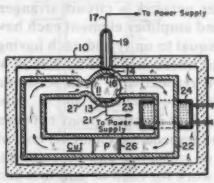
1. A subsonic flow aerodynamic window in a high energy gas laser, which seals off the laser optical cavity from the ambient gas while minimizing the degradation of the laser output beam, comprising:

a gas laser for providing a laser beam including a laser cavity and an outlet chamber for said beam to traverse;
an entrance in said chamber for receiving said laser beam from said laser cavity;
means connected to a flow system for providing a gas for producing a subsonic gas jet flowing transversely to said laser output beam for sealing off said chamber from the ambient gas with reduced degradation of said output laser beam;
an exhaust duct transverse to said chamber for exhausting said gas jet;
convergent nozzle for acceleration of the gas to provide said subsonic flow; and
a plurality of plates and screens positioned in said cavity between said means and said convergent nozzle for reducing the turbulence of the gas jet.

3,936,772
HIGH FLOW METAL HALIDE VAPOR LASER

Eugene W. Sucov, and Lelland A. C. Weaver, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 339,670, March 9, 1973, abandoned. This application Oct. 4, 1974, Ser. No. 511,966
Int. Cl.² H01S 3/22
U.S. Cl. 331—94.5 G **12 Claims**

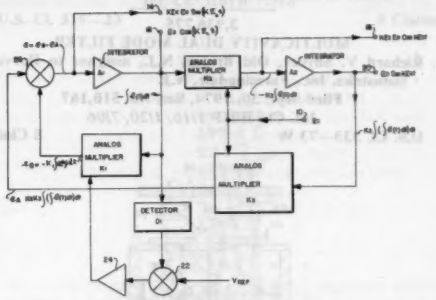


1. A method for obtaining pulsed metal vapor laser transitions at temperatures substantially below the metal vaporization temperature, said method comprising:
A. placing a metal halide of the desired metal within an enclosure;
B. vaporizing said metal halide by heating said metal halide to a temperature not substantially in excess of that required to provide a high molecular vapor pressure and transversely flowing said vapors at at least sonic velocities across a discharge region;
C. maintaining a temperature not substantially greater than said vaporization temperature, said temperature level being such as to prevent substantial thermal dissociation of said metal halide, and, at said temperature
i. collisionally dissociating the metal halide vapor with energized electrons to provide ground state metal atoms of sufficient number density to create resonance radiation trapping, and substantially simultaneously therewith
ii. creating a population inversion between a desired upper laser level and lower laser level of said metal by exciting ground state metal atoms with energized electrons and maintaining a sufficient number of metal atoms in the ground state to preserve said resonance radiation trapping, said energized electrons of steps (i) and (ii) being produced by ionization and having a mean electron energy of at least that required to excite the upper laser level of said metal atom;
D. maintaining said flow velocity to permit said excited metal atoms to remit laser radiation by stimulated emission to a lower laser level within said discharge region and to remove said lower laser level atoms from said discharge region;
E. resonating said stimulated emission; and
F. repeating steps C, D, E and F.

3,936,773
TWO-PHASE QUADRATURE VOLTAGE-CONTROLLED SINE-WAVE OSCILLATOR

Bruce L. Wilkinson, Torrance, Calif., assignor to Taylor C. Fletcher, Long Beach, Calif.

Filed Oct. 17, 1974, Ser. No. 515,499
Int. Cl.² H03B 5/20
U.S. Cl. 331—135 **6 Claims**

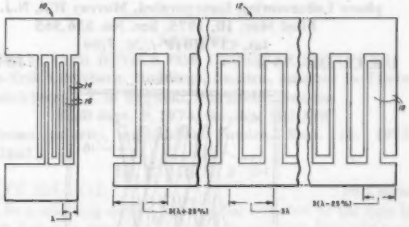


1. A voltage controlled oscillator for generating at least one sinusoidal output signal, said oscillator including: a first loop circuit including analog multiplier means and integrator means serially connected with one another; output terminal means connected to said loop circuit; and input terminal means connected to said analog multiplier meanns to control the multiplication factor of said analog multiplier means in accordance with the value of an applied control voltage so as to control the frequency of the output signal in a linear and continuous direct proportional relationship with the value of the applied control voltage, and in which said first loop circuit includes a first operational integrator and a second operational integrator, a first analog multiplier interposed between the first and second operational integrators, and a second analog multiplier interposed between the second and first operational integrators.

3,936,774
HIGH BULK MODE REJECTION SURFACE WAVE DEVICE

Donald Williams Mellon, Plano, and Richard Alan Kempf, McKinney, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 14, 1974, Ser. No. 450,966
Int. Cl.² H03H 9/02, 9/26, 9/30; H04R 17/10; 310 8;8.1;9.7;9.8
U.S. Cl. 333—30 R **6 Claims**



1. A surface wave device having substantially no bulk mode signal output comprising:
a. a substrate for conveying acoustic waves;
b. a first transducer having a plurality of electrodes in operative association with the substrate for generating acoustic surface waves, each of said plurality of electrodes having a preselected spacing as to an adjacent electrode

at one-half wavelength at a desired operating frequency to reduce substantially the response of the first transducer to bulk waves at the operating frequency; and

c. a second transducer having a plurality of electrodes in operative association with the substrate for receiving the first transducer output, each of said plurality of electrodes having preselected spacings from an adjacent electrode at one-half wavelength of a preselected subharmonic of said operating frequency.

3,936,775

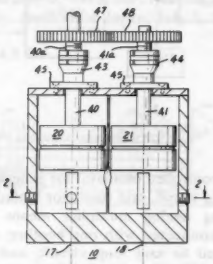
MULTICAVITY DUAL MODE FILTER

Richard V. Snyder, Old Bridge, N.J., assignor to Harvard Industries, Inc., Farmingdale, N.J.

Filed Sept. 30, 1974, Ser. No. 510,167

Int. Cl.² H01P 1/16, 1/20, 7/06

U.S. Cl. 333—73 W **8 Claims**



1. A multicavity waveguide filter comprising a plurality of cylindrical cavaties in which each of said cavities has a pair of orthogonally related modes of propogation,

a plunger for tuning each of said cavities, each of said plungers being disposed within a respective cavity,

each of said cavities having a side wall and being positioned side by side in a series with the long axis of each of said cavities being aligned parallel to each other but not coaxial,

each of said cavities having obstacle splitting means for coupling each pair of orthogonally related modes within the cavity,

iris means formed on a side wall of each of said cavities for coupling selected one of said cavities, and

means mechanically coupling said tuning plungers for simultaneously moving said tuning plungers to predetermined positions within said cavities.

3,936,776

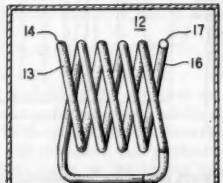
INTERSPERSED DOUBLE WINDING HELICAL RESONATOR WITH CONNECTIONS TO CAVITY

John Robert Sundquist, Melrose, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 10, 1975, Ser. No. 556,565

Int. Cl.² H01P 1/20, 7/04

U.S. Cl. 333—73 R **10 Claims**



1. A helical resonator of the type comprising a housing forming a conductive shield, a helical conductive coil having an end attached to a wall of said shield and an end within said shield, and means insulated from said shield for coupling from outside said shield to said coil, characterized in that said coil includes first and second helical portions having like pitches and interspersed turns, one pair of opposite ends of the two respective portions being connected to said shield.

3,936,777

ARRANGEMENTS FOR SIMULATING INDUCTANCE AND FILTER NETWORKS INCORPORATING SUCH IMPROVEMENTS

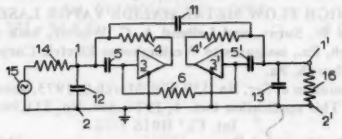
John Mortimer Rollett, and David Richard Wise, both of London, England, assignors to The Post Office, London, England

Filed Sept. 27, 1974, Ser. No. 509,968

Claims priority, application United Kingdom, Oct. 1, 1973, 45860/73

Int. Cl.² H03H 11/00

U.S. Cl. 333—80 R **7 Claims**



1. In a filter network a circuit arrangement comprising a first and second amplifier element each having an overall gain substantially equal to unity and each having a single input and a single output interconnected by way of a first and a second series network respectively, each series network including a resistive impedance element and a capacitive impedance element and a first junction point between said resistive and said capacitive impedance elements and wherein the product of the values or resistance and capacitance of the elements in the series network for each of said first and second amplifiers is equal, a first non-inductive coupling element interconnecting the series networks of the first and second amplifiers, the circuit arrangement being a symmetrical mirror image in terms of components about said first non-inductive coupling element.

3,936,778

MICROSTRIP DEVICE HAVING MODE SUPPRESSING MEANS

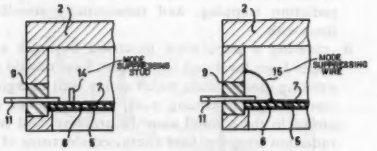
Frans Christiaan De Ronde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,705

Claims priority, application Netherlands, Oct. 17, 1973, 7314268

Int. Cl.² H01P 1/16

U.S. Cl. 333—84 M **2 Claims**



1. A microwave device comprising: a box of conductive material; a substrate arranged parallel to and spaced from one wall of the box, the surface of the substrate facing said one wall being provided with a microstrip line and the opposite surface with a conductive ground plane; at least one coaxial terminal leading through another wall of said box and connected to said microstrip line to supply thereto and derive

therefrom microwave operating signals; and at least one electrically conductive stud connected at one end thereof to the microstrip line and forming substantially right angles therewith, said stud having a length of about ¼ of the wavelength of the operating microwave signal and is spaced from the terminal about ½ of said wavelength.

3,936,779

VACUUM-TIGHT WINDOW ARRANGEMENT FOR A RECTANGULAR-HOLLOW CONDUCTOR

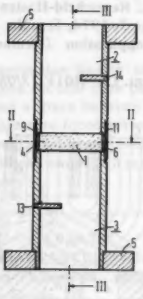
Eugen Achter; Fritz Hanf, both of Munich, and Wolf Wiehler, Neubiberg, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 5, 1975, Ser. No. 555,566

Claims priority, application Germany, Mar. 12, 1974, 2411798

Int. Cl.² H01P 1/04, 1/08

U.S. Cl. 333—98 P **7 Claims**



7. A window and hollow conductor device for microwave utilizing devices comprising a rectangular shaped hollow conductor member having four sides including two short sides and two long sides, a rectangular shaped wave permeable window constructed of a dielectric material received in said hollow conductor, the short sides of said hollow conductor having openings therethrough intermediate the ends of the hollow conductor, the openings dimensioned approximately equal to the opposed dimensions of the window received therethrough, the window extending within the hollow conductor from the opening in one short wall to the opening in the other short wall, end portions of the window extending partially into said openings and being contacted on opposite sides of the window by end wall portions of the short sides defining the openings, metallic spacer plates received in said openings in contact with walls of the window, a four-piece bandage sleeve received around said hollow conductor in the area of the window, the four-piece bandage sleeve including two shorter pieces engaging the short side walls of the hollow conductor and covering the spacer plates and the openings, two longer pieces of the bandage sleeve contacting the long sides of the hollow conductor, the bandage sleeve pieces being in end overlapping relationship with adjacent bandage sleeve pieces, and the bandage sleeve being fixed in place by soldering and providing a vacuum tight seal around the window.

3,936,780

SAFETY DEVICE WITH THERMAL AND ELECTROMAGNETIC RELEASE FOR A MULTI-CONTACT CIRCUIT-BREAKER

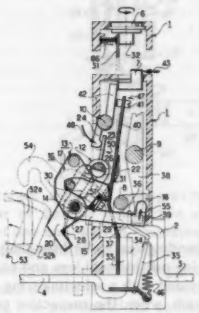
Jean Hennemann, Hombleres, France, assignor to UNELEC, Paris, France

Filed Feb. 12, 1975, Ser. No. 549,461

Claims priority, application France, Feb. 20, 1974, 74.05734

Int. Cl.² H01H 73/48

U.S. Cl. 335—23 **8 Claims**



1. Safety device having a thermal and an electromagnetic release for a multi-pole circuit-breaker comprising means for the detection respectively of overcharge and of short-circuiting actuating, independently from each other, the element for controlling the locking of the said circuit-breaker, characterized in that the said control element (15) is driven respectively directly by an electromagnetic release shaft (8) common to all the poles and which is actuated by the said electromagnetic means (35) for detecting short-circuiting and indirectly through a mechanical power amplifier (12) interposed and controlled by an auxiliary shaft (10) common to all the poles and which are actuated by the said means (40) for the thermal detection of overcharge and in that the said mechanical amplifier (12) comprises a cage (21) having uprights (70); a rotating catch (22) assembled so as to rotate on a shaft transversal to the said cage (21) and which is actuated by the said auxiliary shaft (10), a plunger (20) controlled by the said catch (22) assembled to rotate about a shaft (14) and transmiting the mechanical power of a spring (27) to the said control element (15).

3,936,781

SELECTING DEVICE FOR CROSSBAR SWITCHES

Sven-Erik Lindeberg, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 5, 1974, Ser. No. 503,340

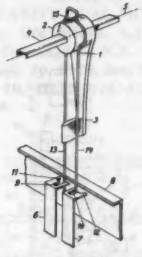
Claims priority, application Sweden, Sept. 18, 1973, 7312665

Int. Cl.² H01H 67/04

U.S. Cl. 335—112 **10 Claims**

1. In a selecting device for crossbar switches of the type in which selecting wires are actuated by selecting bars performing turning movements about an axis of rotation by the action of selecting bar magnets for selection of predetermined contact groups whereby said contact groups can be actuated by lifting devices, moving in a direction substantially parallel to the selecting bars, on operation of bridge magnets, due to transfer of the movements of the lifting devices to the contact groups via the actuated selecting wires, the improvements

comprising selecting wires made of flexible material shaped in a plane to form a symmetrical loop form with two legs, said wires being movably supported in such a manner that each of said selecting bars is encircled by bent ends of the appertaining selecting wires and so that said legs of the selecting wires are swingable in said plane about an axis which is substantially parallel to said axis of rotation of said selecting bar, inner stops and outer stops being arranged adjacent to said selecting wires, whereby, when inactive, said legs of said selecting wires are arranged to rest against said inner stops situated between



said legs and by bending-out to be brought into contact with said outer stops lying outside said legs and each of said selecting bars being provided with a selecting wing adjacent to each selecting wire, which, when the respective selecting bar is in the inactive condition, is arranged to occupy a position midway between said legs of the respective selecting wire when they rest against said inner stops, and by rotation of said selecting bar to lift one of said legs to engage the respective one of said outer stops, whereby said selecting wire is exposed to elastic deformation.

3,936,782

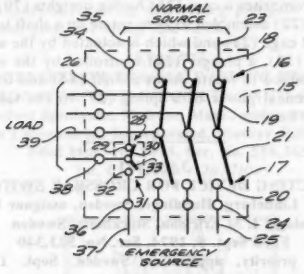
AUTOMATIC TRANSFER SWITCH

William A. Moakler, Basking Ridge, and Charles Stotz, Upper Montclair, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Jan. 29, 1975, Ser. No. 545,052

Int. Cl.² H01H 9/20

U.S. Cl. 335—161 **12 Claims**



1. An automatic transfer switch for transferring an electrical load from a normal source of electric power to an emergency source of electric power, and vice versa, comprising:

a. a first set of phase switches for connection between the normal source and a load,

b. a second set of phase switches for connection between the emergency source and the load,

c. a first neutral switch for connection between a normal source neutral conductor and the load neutral conductor,

d. a second neutral switch for connection between an emergency source neutral conductor and the load neutral conductor,

e. means for operating said phase switches so that only one of said sets of phase switches is closed at any one time and for opening the closed set before closing the open set when transferring the load from one of the power sources to the other, and

f. means for operating said neutral switches so that prior to operation of said phase switches by said means (e) the neutral switch corresponding to the closed set of phase switches is closed and the neutral switch corresponding to the open set of phase switches is open, and during transfer of the load both of said neutral switches are closed before the closed set of phase switches open and both of said neutral switches remain closed until after the closed set of phase switches open and the open set of phase switches close, whereupon the neutral switch which had originally been open remains closed and the neutral switch which had originally been closed opens.

3,936,783

MEDIUM FREQUENCY POWER TRANSFORMER WITH A SECONDARY WINDING SUITABLE FOR A RIGID CONNECTION WITH AN INDUCTOR THROUGH WHICH THE COOLANT FLOWS

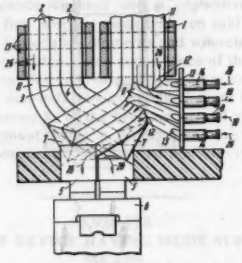
Wilfried Wagemer, Wuppertal, Germany, assignor to AEG-Elotherm G.m.b.H., Remscheid-Hasten, Germany

Filed June 3, 1974, Ser. No. 475,959

Claims priority, application Germany, June 1, 1973, 2328024

Int. Cl.² H01F 27/08

U.S. Cl. 336—62 **4 Claims**



1. In a medium frequency power transformer with a frame, two layers of primary windings, a secondary winding comprising a plurality of secondary conductors which overlap in the area of rigid secondary coolant connections to an inductor through which coolant flows, said two layers of primary windings being arranged at both sides of the secondary winding and formed by hollow conductors and lined up to a packet, and a plurality of ferrite, framelike core bodies enclosing the primary and secondary windings, whereby in the area of the transformer secondary connections, in which the secondary conductors of the secondary winding overlap, no core elements are provided and whereby the overall dimensions of the transformer are small in the direction perpendicularly to the front surfaces of the secondary winding and of the layers of the primary winding as compared to its overall dimensions parallel to these front surfaces, the improvement compising:

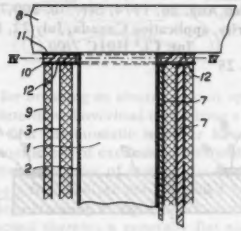
a coolant line arranged with the secondary winding conductors in one layer and disposed along the periphery of the secondary winding, said coolant line having a first separation to which the separation ends are connected by means of coolant connections arranged in the transformer frame, and a second separation in the area of the transformer secondary connections, the ends of the second separation of which are connected with the coolant connections of the inductor.

3,936,784

OIL-FILLED APPARATUS WITH MEANS FOR ACHIEVING PRESSURE BETWEEN PARTS THEREOF

Carl Elfgren, and Erich Spicar, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed May 23, 1974, Ser. No. 472,906
Claims priority, application Sweden, June 20, 1973, 7308657
Int. Cl.² H01F 27/30
U.S. Cl. 336—94 4 Claims



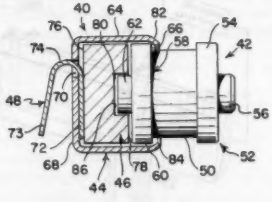
1. An oil-filled apparatus having an iron core part and winding parts arranged on said core part, a casing enclosing said parts, there being a space between two of said parts, and means for exerting pressure force between said core part and said winding parts, said means comprising bodies of an elastomer which absorbs oil and swells as a result of such absorption located in said space.

3,936,785

GAS TUBE ARRESTER SUBASSEMBLY

Gary W. Novak, Des Plaines, Ill., assignor to Cook Electric Company, Morton Grove, Ill.

Continuation of Ser. No. 456,778, April 1, 1974, abandoned.
This application Jan. 15, 1975, Ser. No. 541,125
Int. Cl.² H01H 61/00, 39/00
U.S. Cl. 337—29 18 Claims



1. An arrester subassembly having an arrester with an electrode at one end, said arrester subassembly further comprising:

a shell portion having one end substantially closed and one end substantially open, said shell portion having securing means at said open end to secure said electrode in said shell portion;

a spring means removably mounted on said shell portion at said closed end of said shell portion; and

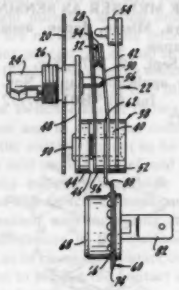
a contact means disposed in said shell portion between said spring means and said electrode.

3,936,786

TEMPERATURE SENSITIVE TIPSWITCH

James A. Peterson, and Donald A. Mc Cabe, both of Morris, Ill., assignors to Bimet Corporation, Morris, Ill.

Filed Feb. 13, 1975, Ser. No. 549,674
Int. Cl.² H01H 29/00
U.S. Cl. 337—80 9 Claims



1. A temperature sensitive and gravity sensitive switch including a pair of flexible conductive arms arranged for contact adjacent one end thereof, insulation means mounting and separating the opposite ends of said arms, a temperature responsive actuating arm and insulating means mounting and separating one end thereof from said conductive arms, means on said actuating arm positioned for contact with one of said conductive arms to effect opening and closing of said conductive arms,

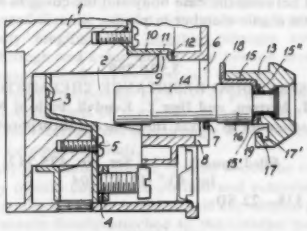
a bracket in electrical contact with a conductive arm and mounted thereto by said insulation means, and a conductive liquid tipswitch mounted in said bracket and connected in series with said conductive arm through said bracket.

3,936,787

CARTRIDGE FUSE CARRIER ASSEMBLY

Pierluigi Ranzanigo, Brescia, Italy, assignor to Bassani S.p.A., Milan, Italy

Filed Mar. 29, 1974, Ser. No. 456,278
Claims priority, application Italy, May 30, 1973, 24840/73
Int. Cl.² H01H 85/14
U.S. Cl. 337—228 8 Claims



1. In a fuse assembly for mounting fuses having electrically conductive ends, a combination comprising a housing having an elongated recess for axially receiving a fuse through an opening; a pair of electrical contact means in said recess at longitudinally spaced locations thereof; fuse cap means for engaging one of said ends of the fuse and axially inserting the latter for effecting electrical contact between the other of said ends of the fuse and one of said spaced contact means; and locking means on said fuse cap means in electrically conductive contact with said one end of the fuse and adapted for movement in a direction transverse to said elongation of said recess for effecting electrical contact between said one end

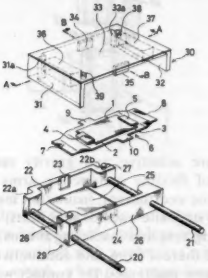
and the other of said spaced contact means only subsequent to said electrical contact created by the axial insertion of said fuse cap means.

3,936,788

THERMOBIMETAL-CARRYING ELASTIC MEMBER AND TEMPERATURE-CONTROL CIRCUIT COMPONENT USING THE MEMBER AS SENSING ELEMENT

Tomoyoshi Uchiya, Misato, Japan, assignor to Uchiya Co., Ltd., Tokyo, Japan

Filed Sept. 19, 1974, Ser. No. 507,360
Claims priority, application Japan, Nov. 6, 1973, 48-124728
Int. Cl.² H01H 37/52
U.S. Cl. 337—372 4 Claims



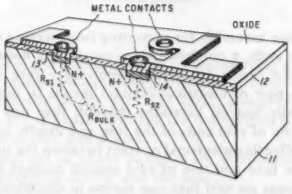
1. A temperature-control circuit component, such as a thermostat, having a thermobimetal-carrying elastic member composed of a bimetal that will recurve or rebound in a springing manner with a temperature change beyond a preset limit and an electrically conductive elastic member having catches for loosely holding the bimetal at both ends, said bimetal being adapted to permit, in the course of its recurving, spring deformation of the elastic member, too, said elastic member being formed with lugs for support on both sides, and a pair of electric contact members adapted to perform electric switching action in cooperation with the elastic member, said electric switching action with temperature changes depending upon the springing deformation of the elastic member with the recurving of the bimetal, the improvement therein comprising a case body having electric contacts at both ends and containing the elastic member, a cover for the case body, and means provided between the case body and the cover to support the lugs of the elastic member in place.

3,936,789

SPREADING RESISTANCE THERMISTOR

Walter T. Matzen, and Don L. Kendall, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 3, 1974, Ser. No. 475,712
Int. Cl.² H01C 7/04
U.S. Cl. 338—22 SD 4 Claims



1. A two-terminal resistor comprising a body of resistive material, an insulating film covering said body and having a plurality of apertures therein which define electrical contact areas, a plurality of spreading-resistance thin-film metal contacts to said body in said apertures, at least two of said thin-film contacts being connected in common to constitute a single terminal of said resistor, and at least one of the remaining contacts constituting the other terminal of said resistor.

3,936,790

TEMPERATURE SENSITIVE RESISTOR HAVING A CRITICAL TRANSITION TEMPERATURE OF ABOUT 140°C

H. Keith Eastwood, Beaconsfield; Thomas R. Simon, Cote St. Luc, and Nguyen N. Khoi, Montreal, all of Canada, assignors to Multi-State Devices, Ltd., Dorval, Canada

Filed Aug. 26, 1974, Ser. No. 500,732
Claims priority, application Canada, July 22, 1974, 205362
Int. Cl.² H01C 7/00
U.S. Cl. 338—25 6 Claims

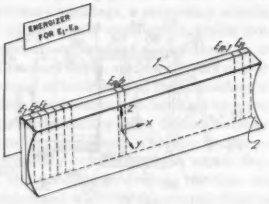
1. A solid state switching device comprising a temperature sensitive resistive element of V_3O_5 material which exhibits an abrupt decrease in electrical resistance at about 140°C, and electrode lead wires attached to spaced points of said temperature sensitive resistive element for connecting such temperature sensitive resistive element to an electrical circuit.

3,936,791

LINEAR ARRAY ULTRASONIC TRANSDUCER

George Kossoff, Northbridge, Australia, assignor to The Commonwealth of Australia, Australian Capital Territory, Australia

Filed Sept. 13, 1973, Ser. No. 397,003
Int. Cl.² G01N 29/04; G01S 9/66
U.S. Cl. 340—1 R 3 Claims



1. Apparatus for the ultrasonic examination of an object comprising:

a phased array transducer comprising a plurality of transducer elements for directing pulses of ultrasonic energy along a beam into the said object;

means for exciting the elements of the array in phased relation for focusing and scanning the beam in the longitudinal plane of the transducer; and

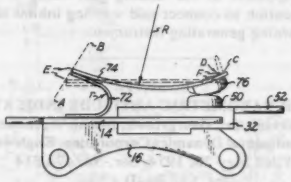
focusing means for focusing the dimensions of said beam normal to the longitudinal plane of the transducer.

3,936,792

CIRCUIT BREAKER APPARATUS

Ronald E. Senor, Norton, Mass., and George Trenkler, East Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 302,158, Oct. 30, 1972, Pat. No. 3,818,404. This application Apr. 10, 1974, Ser. No. 459,527
Int. Cl.² H01H 61/04
U.S. Cl. 337—85 6 Claims



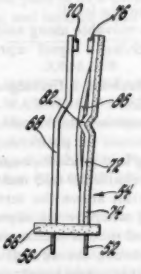
1. A switch for breaking an electric circuit upon the occurrence of a predetermined overload comprising a base, a generally U-shaped first thermostatic member having respective high and low coefficient of expansion sides and having a first value of resistivity per unit of length, the first thermostatic member having a first and second leg joined by a bight portion, the first leg extending along the surface of the base and physically attached thereto, a generally flat second thermostatic strip member having respective high and low coefficient of expansion sides and having a value of resistivity per unit of length less than that of the first thermostatic member, the second leg of the first thermostatic member extending along a portion of the second thermostatic member and physically attached thereto with the sides contacting each other of dissimilar coefficient of expansion, a stationary contact mounted on the base electrically separated from the first and second thermostatic members, a movable contact mounted on the second thermostatic member and adapted to move into and out of engagement with the stationary contact, and means to provide electrical connection to the thermostatic members and the stationary contact whereby heating of the first thermostatic member causes increased contact force and contact wiping until deflection of the second thermostatic member causes separation of the contacts.

3,936,793

HUMIDITY AND TEMPERATURE RESPONSIVE SWITCH

William A. Armstrong, Grosse Ile, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 11, 1974, Ser. No. 522,474
Int. Cl.² H01H 37/02
U.S. Cl. 337—300 3 Claims



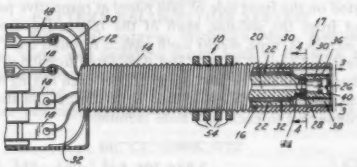
1. A temperature and humidity responsive switch comprising: a base member; an elongated stationary member with one end attached to said base member and a second end supporting a contact; an elongated bendable switch element having one end attached to said base member and a movable second end supporting a contact in alignment with the contact on said stationary member so as to cause engagement of said contacts when the second end of the switch element moves toward said stationary member during bending of the switch element; said switch element having a laminated structure with a metal portion and a plastic portion bonded together in a manner so that differences in their respective coefficients of thermal expansion affect the position of the movable second end of said switch element with respect to said second end of the stationary member; said elongated switch element being separated by slot means into side by side strip portions whose end portions adjacent said movable second end are joined and whose mid-portions are movable in the lateral direction with respect to one another; at least one of said strip portions being shortened in length, thereby causing the middle of the remaining strip portion to bend laterally in one direction from the general plane of the switch element during a low range of ambient temperatures and to cause the contact on the movable second end of the switch element to be positioned away from the contact on said second end of said stationary member and subsequently causing the middle portion to pass through the plane of the switch element and to bend in an opposite lateral direction with increasing ambient temperatures due to the differences in thermal coefficients of the metal and plastic so as to cause the contact on the second end of the switch element to engage the contact on the stationary member in a rapid and positive manner.

3,936,794

EXHAUST GAS SENSOR PROBE

Gordon L. Beaudoin; Dante S. Giardini, both of Dearborn Heights, and Allen H. Meitzler, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 27, 1974, Ser. No. 483,723
Int. Cl.² H01C 13/02
U.S. Cl. 338—34 12 Claims



1. A probe for inserting a wafer of exhaust gas sensor ceramic material into the exhaust gas flow system of an internal combustion engine, comprising in combination:

an elongated ceramic support member having a plurality of generally longitudinally directed passages extending therethrough and a cup-shaped end portion arranged to open longitudinally away from said passages;

said cup-shaped portion having a pair of generally longitudinally directed slots on the inner surface thereof defining means for receiving and supporting a wafer of exhaust gas sensor ceramic materials;

a generally continuous groove formed about the outer periphery of said cup-shaped portion and extending along substantially the entire length of said cup-shaped portion;

housing means fixedly attached to the exterior portion of said support member and including means for mounting the housing to an exhaust gas system so that the cup-shaped portion of the support member extends into the interior of the exhaust gas system;

electrical terminal means attached to said housing so as to be exterior to the exhaust gas system when said housing means is attached to an exhaust gas system;

electrical heater wire means received within said groove for heating the interior of the cup-shaped portion and arranged to electrically communicate through at least a portion of said plurality of support member passages with said electrical terminal means.

3,936,795

COMBINED VARIABLE RESISTOR ASSEMBLY PROVIDED WITH TAP POSITION INDICATOR MEANS

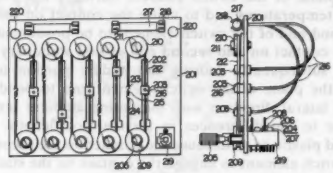
Matsuo Nishioka; Shunzo Oka, both of Hirakata; Akitoshi Miyashita, Suita, and Kazuo Oshima, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 427,735, Dec. 26, 1973. This application Feb. 12, 1975, Ser. No. 549,149

Claims priority, application Japan, Dec. 28, 1972, 48-4578[U]

Int. Cl.[2] H01C *5/00*

U.S. Cl. 338—119 6 Claims



1. A combined variable resistor assembly provided with position indicator means, comprising a panel formed with a plurality of slots, variable resistors corresponding in number to the number of said slots and mounted on said panel, slide members slidably engaged in said respective slots, said variable resistors having respective operable shafts and terminals extending straight and in the same direction, each of said variable resistors further including a brush holder rotatable in unison with said operable shaft, first pulleys secured to the operable shaft of said respective variable resistors, second pulleys paired with said respective first pulleys and rotatably mounted on the front side of said panel at respective positions spaced from the slidable span of the respective associated slide members, rope means each passed through each pair of said first and second pulleys and connected to each said slide member, a light source, and optical fibers each having one end held in the neighborhood of said light source and the other end connected to each said slide member.

3,936,796

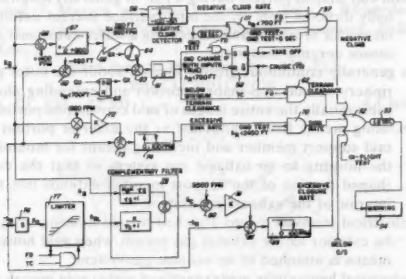
AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT

Charles Donald Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Division of Ser. No. 480,727, June 19, 1974. This application Jan. 27, 1975, Ser. No. 544,484

Int. Cl.[2] G01C *5/00*

U.S. Cl. 340—27 AT 11 Claims



1. In an aircraft instrument for generating a warning to an operator in the event an aircraft descends below a predetermined altitude, except with flaps extended in a landing configuration, means inhibiting generation of a warning for enabling a warning free low altitude approach to a landing with the flaps up and landing gear down, comprising:

means generating a signal representing the barometric rate of descent of the aircraft;

means responsive to the barometric descent rate signal indicating a descent rate less than a predetermined value for generating a warning inhibit signal;

means sensing the position of the aircraft landing gear; and

means responsive to the landing gear being in a landing configuration to connect said warning inhibit signal with said warning generating instrument.

3,936,797

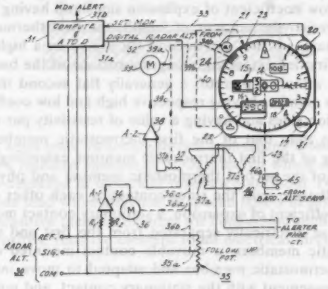
RADAR-BAROMETRIC ALTITUDE INDICATOR

John H. Andresen, Jr., Georgetown, British W. Indies, assignor to Intercontinental Dynamics Corporation, Englewood, N.J.

Filed May 28, 1974, Ser. No. 473,514

Int. Cl.[2] B64D *43/00*

U.S. Cl. 340—27 AT 7 Claims



1. An instrument for use in aircraft comprising:

a dial face having graduations;

a mechanism including a movable pointer cooperating with said graduations to provide a corrected barometric altitude reading;

a first index movable along said graduations;

manually operable knob means coupled to said first index for positioning said first index at any desired location along said graduations to provide an altitude reading representative of the altitude of an aircraft landing strip typically relative to sea level;

second index means movable along said graduations;

first means for receiving a signal representative of radar altitude;

second means for receiving a first signal representative of barometric altitude;

third means for combining the signals received from said first and second means for positioning said second index at a position along said graduations to provide an instantaneous reading relative to said movable pointer of the height of the aircraft above the terrain over which the aircraft is passing whereby the separation distance between said first and second indices represents the difference in height between the aircraft landing strip whose height has been set into said instrument and the height of the terrain below the aircraft, said first and second indices cooperating to provide a self-checking feature to determine the accuracy of the information introduced into the instrument and of the operation of the instrument such that the first and second indices should be superimposed upon one another before touchdown of the aircraft on the aforesaid landing strip.

3,936,798

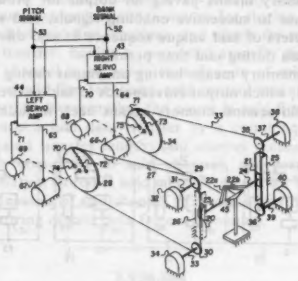
INDICATOR DISPLAY MECHANISM

Lester W. Haerther, and Leo P. Kammerer, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 29, 1974, Ser. No. 518,439

Int. Cl.² G08G 5/00

U.S. Cl. 340—27 NA 16 Claims



1. An indicator mechanism comprising: a fixed reference index member symmetrically disposed about the longitudinal viewing axis of an instrument, a moveable indicating member supported in a plane substantially normal to the longitudinal axis of said instrument and extending in said plane symmetrically with respect to, and transverse of, the vertical center axis of said instrument; drive means for displacing said indicating member within the plane defined thereby and transversely of said instrument longitudinal axis in accordance with a first input parameter and for rotating said indicating member about a point on said vertical center axis in accordance with a second input parameter, said drive means comprising termination means between which respective ends of said indicating members are extended, said terminating means comprising at least diametrically opposed peripheral portions of a cylinder with said indicating member extending along that diameter of said cylinder; first and second dial cords in respective driving engagement with said termination means, each said dial cord being of fixed length and having first and second portions thereof oppositely extending in peripheral engagement with said termination means and carried circumferentially over the arcuate periphery thereof and affixed thereto at a circumferential point beyond the point of tangency defined by the diameter along which said indicating member extends, first and second drive pulley means over which said first and second drive cords are respectively carried, and means for rotating each of said drive pulleys as a predetermined differential function of said first and second input paramenters.

3,936,799

AUTOMOTIVE VEHICLE ROTARY DISPLAY AND WARNING DEVICE

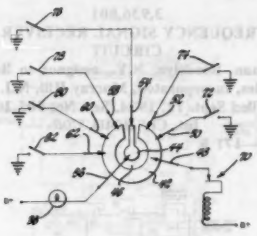
Roy G. Hynes, Flushing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1973, Ser. No. 384,612

Int. Cl.² G08B 19/00

U.S. Cl. 340—52 F 2 Claims

1. An automotive vehicle rotary display and warning device for indicating the occurrence of events at remote locations in the vehicle, comprising: a plurality of event sensors positioned at remote locations in the vehicle, each of said event sensors being responsive to the occurrence of a respective event for generating an electrical signal upon said occurrence; a viewing window; a drum rotatably supported adjacent the viewing window; a plurality of messages spaced around the drum so as to be sequentially positioned adjacent the viewing window as the drum is rotated, each of the messages representing the occurrence of a respective one of the events; a lamp for illuminating the message adjacent the viewing window when said lamp is energized; an audible indicator; and rotary switch means operated by rotation of the drum, the rotary switch means including first coupling means for exclusively coupling the event sensor which monitors the occurrence of the event represented by the message positioned adjacent the viewing window to the lamp and second coupling means for exclusively coupling the event sensors which monitor the occurrence of the events represented by the messages positioned



away from the viewing window to the audible indicator, the lamp and the audible indicator being energized by an electrical signal generated by one of the event sensors coupled thereto, whereby an audible warning is immediately provided upon the occurrence of an event not represented by the message adjacent the viewing window and the audible indicator is extinguished and the lamp is energized to illuminate the message representing the occurrence of said event when the drum is rotated to position said message adjacent the viewing window.

3,936,800

PATTERN RECOGNITION SYSTEM

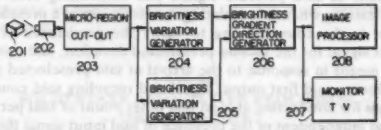
Masakazu Ejiri, Tokorozawa; Michihiro Mese, Kokubunji; Haruo Yoda, and Sadahiro Ikeda, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 27, 1974, Ser. No. 455,420

Claims priority, application Japan, Mar. 28, 1973, 48-34493

Int. Cl.² G06K 9/12

U.S. Cl. 340—146.3 MA 7 Claims



1. A pattern recognition system comprising:

at least one pick-up device for converting an image of a picture plane into an electrical signal indicative thereof;

means for successively taking out of a plurality of electrical signals, each electrical signal being representative of a divided region of the image of the picture plane, region by region from the output of said pickup device;

means for producing first and second signals indicating rates of changes in brightness along different directions of a region by reference to signals representative of adjacent regions thereto;

means for producing third signals, each signal indicating the direction of the change in the brightness within each of said regions, from said first and second signals;

means for encoding said third signals into a code signal by classifying said third signals in accordance with directions of the change in the brightness, counting said signals classified into said respective directions, and digitizing

the respective counted values in accordance with a predetermined value;

means for storing in advance a code signal indicative of an image corresponding to the background of the picture plane; and

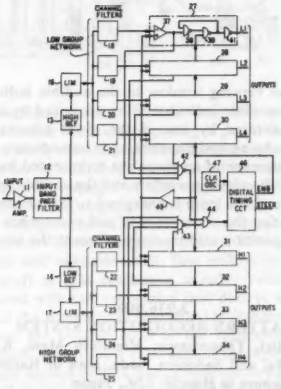
means for comparing the code signal from said encoding means with the code signal from said storing means to detect the degree of disagreement therebetween as an indication of an object in the picture plane.

3,936,801

MULTIFREQUENCY SIGNAL RECEIVER TIMING CIRCUIT

Dennis Shuman, Brooklyn, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 12, 1974, Ser. No. 505,204
Int. Cl.² H04Q *5/00*
U.S. Cl. 340—171 R **11 Claims**



1. Signal translating means for generating a first output signal of a first preselected duration in response to an input signal of a second preselected duration comprising, in combination, clocking means for generating a periodic signal at a predetermined repetition rate, counting means responsive to the presence of said input signal for beginning and maintaining a count of said periodic signal, and controlling means for ascertaining when said counting means arrives at a preselected point in the count serving to verify the persistence of said input signal for the second preselected duration, said controlling means in response to the arrival at said preselected point producing said first output signal and recycling said counting means for conducting at least one other count of said periodic signal independent of the presence of said input signal thereby establishing the first preselected duration of said first output signal.

3,936,802

CONTROL DEVICE FOR RECORDING ELEMENTS

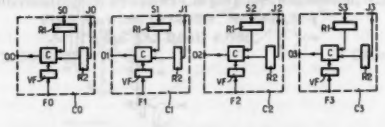
Robert Francois Champiau, and Andre Achille Brecy, both of Belfort, France, assignors to Societe Industrielle Honeywell Bull, Paris, France

Filed Sept. 5, 1972, Ser. No. 286,513
Int. Cl.² G06F *3/08, 3/12, 7/04*
U.S. Cl. 340—172.5 **10 Claims**

1. In a control system including a plurality of recording elements each capable of recording successive characters of a unique sequence of characters at respected discrete time intervals during a time period, said time period being divided into a plurality of cycles and said recording elements being grouped into sets such that each recording element of a given set has the capability of recording once and at a unique discrete time interval during a given cycle, the unique discrete time interval respective to one recording element within a given set being different from the unique discrete time interval respective to any other recording element within the same given set; a plurality of control circuits, one for each recording element, each control circuit being effective to cause a given recording element to record a desired character of said unique sequence within said time period, each control circuit comprising in combination:

first memory means having an output for producing, in response to successive enabling signals, said successive characters of said unique sequence at said discrete time intervals during said time period;

second memory means having an output during said time period, which output corresponds to said desired character, said second memory means each including an enabling circuit for causing said second memory means to be updated with a new desired character, said enabling circuits being interconnected so as to effect successive updating of each of said second memory means;



comparison means connected to the outputs of said first and second memory means for producing an output signal when said first memory means produces a character which matches said desired character as indicated by said second memory means, each of said comparison means including a further enabling circuit which enables the output signal of said comparison means only during its respective unique discrete time intervals; and

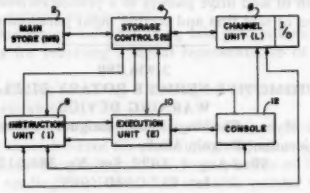
further means connected to said comparison means and responsive to said output signal of said comparison means so as to actuate said given recording element causing it to record said desired character.

3,936,803

DATA PROCESSING SYSTEM HAVING A COMMON CHANNEL UNIT WITH CIRCULATING FIELDS

James A. Kaizman, and Yoshiro Yoshioka, both of San Jose, Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Nov. 19, 1973, Ser. No. 417,256
Int. Cl.² G06F *3/04*
U.S. Cl. 340—172.5 **13 Claims**



1. A data processing system including system storage apparatus and channel unit apparatus for transmitting data received from input/output devices over a plurality of channels to said storaoge apparatus, the improved channel unit apparatus comprising,

channel store means for storing information including said data to be transferred over said channels,

state memory means, common to all of said channels, having a plurality of groups of locations, one group for each of said channels where each group stores information for a different associated channel; said state memory means

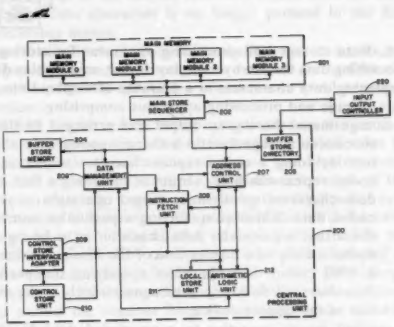
including, for each group, first locations for storing a count to designate a remaining transfer length where the remaining transfer length specifies a number of bytes of said data remaining to be transferred over the associated channel, and

data access control means, common to all of said channels, for controlling the transfer of said data over said channels, said control means including means connected to said state memory means for cyclically accessing the locations for each channel, means for storing said count in each of said first locations, and means for requesting a data transfer, having a requested transfer length, over each channel in response to a decode of said count in each of said first locations, said control means including means for decrementing the count in said first locations for each actual data transfer by a count equal to the requested transfer length; said control means including means connected to said channels and responsive to information stored in said memory means for controlling the accessing of said channel store means for the fetching and storing of said data for each channel.

3,936,804
DATA PROCESSING SYSTEM INCORPORATING A LOGICAL MOVE INSTRUCTION

Charles W. Bachman, Lexington, Mass., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Dec. 13, 1973, Ser. No. 424,381
Int. Cl.² G06F 9/12
U.S. Cl. 340—172.5 **6 Claims**



1. An apparatus for moving data fields having a plurality of data structures from a first location to a destination said apparatus comprising:

means for storing a move instruction;

means responsive to one portion of said move instruction for addressing said first location which contains a first data field descriptor, said first data field descriptor describing the location and attributes of a data field;

second means responsive to a second portion of said move instruction for addressing said destination which contains a second data field descriptor, said second data field descriptor describing the location and attributes of a data field when stored in said destination; and

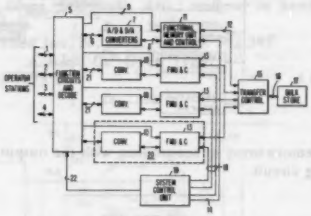
means responsive to a third portion of said move instruction for transferring one data field from said first location to said destination, said transferring means including means for reformatting at execution time said one data field to conform with the attributes described by said second data field descriptor;

said attributes of said first and said second data field descriptors including data type, key field and length descriptions.

3,936,805
DICTATION SYSTEM FOR STORING AND RETRIEVING AUDIO INFORMATION

Charles Ronald Bringol; Denis Earl Lowry, and Charles Luther Ridings, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,755
Int. Cl.² G06F 3/16
U.S. Cl. 340—172.5 **18 Claims**



1. A dictation system comprising:

a. receiving means for receiving information input into said system in audio form;

b. converting means for converting information received by said receiving means in audio form to digital form;

c. first and second storage means for storing information received in audio form by said receiving means and converted to digital form by said converting means;

d. third storage means, for storing information transferred from said first and second storage means;

e. fourth storage means, being a bulk store such as a recording belt, for storing information transferred from said first and second storage means;

f. transfer means for 1) transferring information converted by said converting means alternately to said first and second storage means at a first clock rate, and 2) alternately transferring information stored in said first and second storage means out of said first and second storage means and to said third storage means at a second clock rate for immediate processing: and;

g. control means for causing information alternately transferred out of said first and second storage means by said transfer means to be transferred to said fourth storage means at said second clock rate for more permanent storage.

3,936,806
SOLID STATE ASSOCIATIVE PROCESSOR ORGANIZATION

Kenneth E. Batcher, Stow, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Continuation-in-part of Ser. No. 270,903, July 12, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 457,155
Int. Cl.² G06F 7/00; H03K 19/00
U.S. Cl. 340—172.5 **5 Claims**

1. A digital computer organization, comprising:

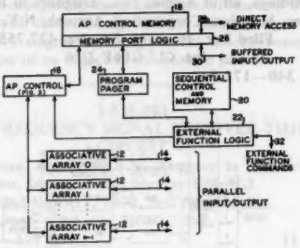
a memory array comprised of a plurality of address line encoded binary solid state memory modules and containing data bit storage elements wherein data may be stored as bit-comprised words with bit B of module M containing bit B of word W in accordance with the formula $M = B$ W and wherein B, M, and W are n-element binary vectors, respectively unique for each bit, module, and word, and where n is an integer greater than 1;

a logic circuit means connected to the memory array for simultaneously performing logic and arithmetic operations on all accessed data bits;

a coding circuit; and

permuting circuit means connected to the coding circuit

and between the memory array and logic circuit means for ordering the lineal order of data into and out of the



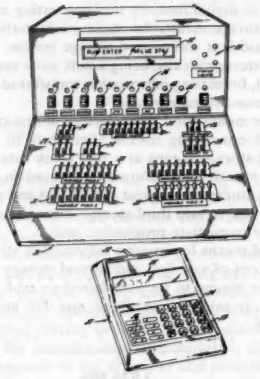
memory array in accordance with the output of the coding circuit.

3,936,807

SENSOR BASED COMPUTER TERMINAL

Raymond A. Edwards, New York, N.Y., assignor to Michigan Avenue National Bank of Chicago, Chicago, Ill.

Filed Apr. 12, 1974, Ser. No. 460,461
Int. Cl.² G06F *3/02, 3/04;* G08C *15/12;* H04J *3/12*
U.S. Cl. 340—172.5 **13 Claims**



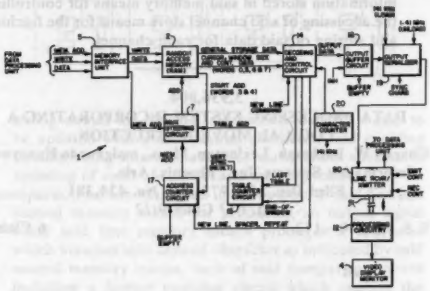
1. In a data acquisition system having a plurality of data sources at a collection station, a processor at a processing station, and transmission means coupling said stations, the combination comprising, input means at the collection station coupled to the data sources for receiving input data, means for assigning a source address to each data source, scanning means coupled to the input means for selecting individual ones of the data sources and forming an input digital word including the source address and the input data received by the selected source, means for serializing the input digital words and coupling the serialized words to the transmission means, means at the processing station coupled to the transmission means for receiving and deserializing the serialized words, means for loading the deserialized words including the data and source address into the processor, whereby data collected at the collection station is efficiently identified and transferred to the processor, output means at the collection station for responding to output data, said output means having at least one output channel, means for assigning a destination address to each output channel, means at the processing station for receiving output data and the address of a selected output channel from the processor, means for forming an output digital word including the output data and the destination address of the selected output channel, means for serializing the output digital word and coupling said serialized word to the transmission means, and means at the collection station for deserializing the serialized word and coupling the data within said word to the addressed output channel, whereby effective two-way communication is provided between the processing station and the collection station.

3,936,808

DATA STORAGE AND PROCESSING APPARATUS INCLUDING PROCESSING OF REPEAT CHARACTER SEQUENCES

Joseph L. O'Neill, Jr., Haddonfield, N.J., assignor to Ultronic Systems Corporation, Moorestown, N.J.

Filed Sept. 3, 1974, Ser. No. 502,988
Int. Cl.² G06F *3/14*
U.S. Cl. 340—172.5 **9 Claims**



1. Data storage and processing apparatus for storing and processing data for use by a display device, said display device displaying data characters in a plurality of display lines, said data storage and processing apparatus comprising:

storage means having an output and arranged to store in successive storage locations therein coded data characters including a coded repeat character sequence, said coded repeat character sequence including a first coded data character specifying a repeat operation, a second coded data character specifying a particular number of times that a particular data character is to be repeated consecutively in a display line of the display device, and a third coded data character specifying the particular data character to be repeated consecutively in the display line of the display device;

readout means operative to cause coded data characters stored in the storage means to be read out therefrom to the output of the storage means;

first receiving means coupled to the output of the storage means and operative to receive and store in succession each of the coded data characters read out from the storage means;

first circuit means coupled to the first receiving means and operative to detect the first coded data character of the repeat character sequence received and stored in the first receiving means;

second receiving means coupled to the first receiving means and having an output, said second receiving means being operative to receive and store therein coded data characters received by and stored in the first receiving means;

second circuit means coupled to the first circuit means and to the second receiving means and operative in response to the detection by the first circuit means of the first coded data character of the repeat character sequence to inhibit the second receiving means from receiving the first and second coded data characters of the repeat character sequence;

third circuit means coupled to the first circuit means and having first, second and third stages, said third circuit means being operative in response to the detection by the

first circuit means of the first data character of the repeat character sequence to establish an item of information in the first stage thereof;

fourth circuit means coupled to the third circuit means and operative to transfer the aforesaid item of information in succession along the stages of the third circuit means;

fifth circuit means coupled to the second stage of the third circuit means, to the first receiving means and to the readout means, said fifth circuit means being operative when the item of information in the third circuit means has been transferred by the fourth circuit means from the first stage to the second stage to receive and retain therein the number as specified by the second coded data character of the repeat character sequence, and operative in response to the receipt and retention therein of the aforesaid number to inhibit the readout means from causing the further readout from the storage means of additional coded data characters and to enable the first receiving means to freeze therein the third coded data character of the repeat character sequence then present in the first receiving means;

said second circuit means also being coupled to the third stage of the third circuit means and operative when the item of information in the third circuit means has been transferred by the fourth circuit means from the second stage to the third stage to enable the second receiving means to receive and store therein the third coded data character of the repeat character sequence then present in the first receiving means;

sixth circuit means operative to cause the third coded data character of the repeat character sequence received by the second receiving means to be applied repeatedly to the output of the second receiving means until the third coded data character is no longer present in the first receiving means;

seventh circuit means coupled to the fifth circuit means and operative to reduce the number retained in the fifth circuit means, by successive counts, to a predetermined value;

said fifth circuit means being operative when the number therein has been reduced to the predetermined value by the seventh circuit means to cause the first receiving means to release the third coded data character of the repeat character sequence, whereby the third coded data character is repeated at the output of the second receiving means for a total number of times determined by the number specified by the second coded data character of the sequence and initially applied to the fifth circuit means, and further operative to enable the readout means to permit the readout from the storage means of additional data characters.

3,936,809

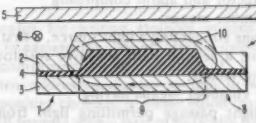
SINGLE FLUX QUANTUM STORAGE DEVICES AND SENSING MEANS THEREFOR

Hans H. Zappe, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 7, 1974, Ser. No. 477,387

Int. Cl.² G11C *11/44*

U.S. Cl. 340—173.1 **45 Claims**



1. A Josephson junction device for storing single flux quantum in the absence of an external magnetic field comprising

first and second superconductive elements,

an insulation layer the thickness of which is sufficient to permit Josephson tunneling along the length thereof disposed between said elements, and

means integral with at least one of said elements and said layer for generating a current density profile having a larger magnitude at the boundary portions of said device than at the center portion of said device.

3,936,810

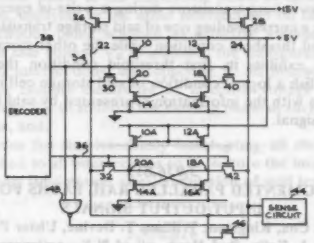
SENSE LINE BALANCING CIRCUIT

William C. Dunn, Scottsdale, Ariz., assignor to Semi, Inc., Phoenix, Ariz.

Filed Jan. 20, 1975, Ser. No. 542,395

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 FF **4 Claims**



1. In a semiconductor memory of the type wherein there is an array of binary memory elements, for each column of elements there is provided a common pair of sense lines connected to each element, for each row of elements there being provided a common access line for enabling read out of the data stored in the elements connected thereto, the improvement comprising

for each pair of sense lines, a separate means for equalizing voltages on said pair of sense lines during the intervals between actuation of said chip select lines for providing a read out from said memory.

3,936,811

ASSOCIATIVE STORAGE CIRCUIT

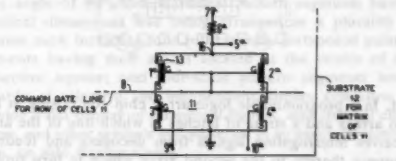
Karlheinrich Horninger, Egiharting, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 24, 1974, Ser. No. 508,807

Claims priority, application Germany, Sept. 24, 1973, 23479687

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 AM **10 Claims**



1. As associative storage circuit including a storage cell capable of assuming two logical conditions and comprising:

a pair of output circuit points for supplying a binary output signal representing the identity or lack of identity of an external logical comparison signal supplied to said storage cell and the logical condition of said storage cell,

a pair of circuit arms connected in parallel between said output circuit points and forming said storage cell, each

of said circuit arms having a storage transistor and a switching transistor in series,

a supply voltage circuit connected with said output circuit points for supplying operating potentials to said transistors,

said switching transistors each being controllable in accordance with an external logical comparison signal supplied thereto during a readout operation, and each being controllable in accordance with a logical information signal representing the information to be stored in said storage cell during a write-in operation,

said storage transistors each having a gate including a gate insulator for providing selectively a first threshold condition and a second threshold condition of the storage transistor, and

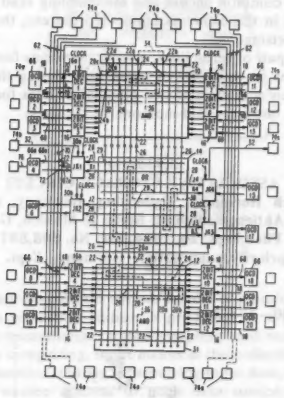
said circuit arms being responsive to write-in potentials applied to the gates of said storage transistors in conjunction with the logical information signal applied to each of said switching transistors during a write-in operation to place a corresponding one of said storage transistors in its second threshold condition while the other storage transistor exhibits its first threshold condition thereby to establish a logical condition of said storage cell in accordance with the information represented by said information signal.

3,936,812

SEGMENTED PARALLEL RAIL PATHS FOR INPUT/OUTPUT SIGNALS

Dennis T. Cox, Kingston; William T. Devine, Ulster Park, and Gilbert J. Kelly, Red Hook, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,218
Int. Cl.[2] G11C 5/02, 5/06
U.S. Cl. 340—173 R 8 Claims



1. In a programmable logic array chip comprising at least two arrays and a string of latches in which one of the arrays receives interrogation signals from decoders and feeds the response thereto to the second array which in turn supplies inputs to the latches, an arrangement for the supplying of inputs to the decoders and receiving of outputs from the latches comprising:

connections to the inputs of the decoders and the outputs of the latches extending in a side by side relationship; and

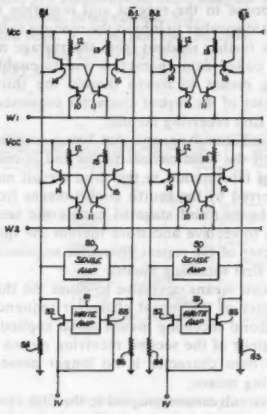
a series of colinear rails crossing the connections to form a grid of intersecting connections, individual rails being electrically coupled to certain of the connections and electrically isolated from others and having breaks therein which divide the rails into segments so that signals on different segments of the same rail are electrically isolated from one another.

3,936,813

BIPOLAR MEMORY CELL EMPLOYING INVERTED TRANSISTORS AND PINCHED BASE RESISTORS

Frederick Tsang, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 354,252, April 25, 1973, abandoned.
This application Jan. 20, 1975, Ser. No. 542,346
Int. Cl.[2] G11C 11/40
U.S. Cl. 340—173 FF 11 Claims



10. A memory cell comprising:

first and second transistors formed in a first region of a first conductivity type, each having an emitter and a base, and having common collectors formed by said first region;

third and fourth transistors formed in a second region of a first conductivity type, said third and fourth transistors each having an emitter and a base and having a common collector formed by said second region;

first and second resistors formed by extensions of the base regions of said third and fourth transistors;

means for coupling said emitter of said first transistor to said base of said second transistor and said base of said third transistor; and

means for coupling said base of said first transistor to said emitter of said second transistor and said base of said fourth transistor.

3,936,814

SMOKE DETECTOR AND ALARM

Otto Muller-Girard, Rochester, and Chester W. Bray, Hilton, both of N.Y., assignors to Bernz-O-Matic Corporation, Rochester, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,442
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—237 S 7 Claims

1. Smoke detector and alarm comprising

a. smoke chamber means;

b. circuit means connecting a light source, a first light sensitive resistor, a second light sensitive resistor and electronic alarm means;

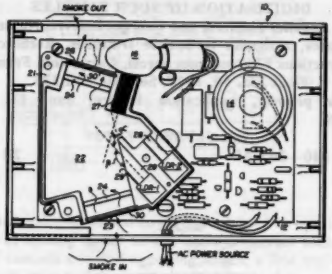
c. the smoke chamber means having

i. a first light passage permitting light from the light source to illuminate the interior of said chamber;

ii. a second light passage positioned relative to said first passage so as to permit light from said first passage to fall on said second light sensitive resistor;

iii. a third light passage positioned relative to said first passage so as to permit only light reflected by smoke present in said chamber to fall on said first light sensitive resistor said third light passage being parallel to said second light passage; and

iv. said first, second and third light passages providing unobstructed, direct communication for said light source and said light sensitive resistors with the interior of said smoke chamber;



d. said circuit means having:

i. alarm circuit means causing said alarm means to emit a continuous sound when light from said source is reflected by smoke present in said chamber onto said first light sensitive resistor; and

ii. trouble circuit means causing said alarm means to emit an intermittent sound when light fails to fall on said second light sensitive resistor.

3,936,815

APPARATUS AND METHOD FOR WRITING STORABLE IMAGES INTO A MATRIX-ADDRESSED IMAGE-STORING LIQUID CRYSTAL DISPLAY DEVICE

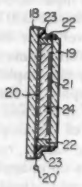
Osamu Kogure, Mito; Hisao Takada, Tokyo; Yoshinori Kato, and Masao Kawachi, both of Mito, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed July 29, 1974, Ser. No. 492,421

Claims priority, application Japan, Aug. 6, 1973, 48-87580; Sept. 7, 1973, 48-100365; Mar. 8, 1974, 49-26205; June 11, 1974, 49-65623

Int. Cl.² G02F 1/18

U.S. Cl. 340—324 M **7 Claims**



1. Apparatus for writing storable images into a matrix-addressed image-storing liquid crystal display device, said apparatus comprising the combination of:

1. a matrix-addressed display section in which an inductively positive cholesteric phase liquid crystal is contained in a cell formed with a pair of optically transparent plates having on one surface of each a plurality of parallel strip electrodes, said electrodes on at least one of said plates being transparent, and opposed to each other through a spacer with the electrodes mutually intersecting at right angles so as to form row and column electrode groups, the inner surfaces of said plates being subjected to a treatment of vertical orientation so as to render liquid crystal molecules adjacent said surfaces vertical with respect to said surfaces, and said cholesteric phase liquid crystal having its molecules adjacent the inner surfaces of the transparent plates arranged vertical to the surfaces by said treatment.

2. means for applying to all intersections of said row and column electrode groups a voltage above a threshold voltage V_H at which said liquid crystal shifts from the cholesteric phase to a nematic phase so that a transparent state is achieved at all said intersections,

3. means for sequentially scanning the column electrodes while applying to selected intersections, for displaying the image on the column electrodes being scanned, an effective voltage below the voltage V_H to effect a shift from the nematic phase to the cholesteric phase at such intersections, applying to the other intersections on the column electrodes being scanned an effective voltage not less than said voltage V_H to maintain the transparent state at such intersections, and applying to all intersections of other column electrodes an effective voltage near the voltage V_H to stabilize the existing phase at such intersections, and,

4. means for simultaneously interrupting all the voltages applied to all intersections so as to store the image within a short time period after completion of said scanning.

3,936,816

FLAT DISPLAY SYSTEM

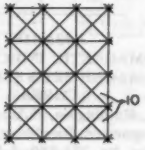
Yuich Murata, Kamakura, Japan, assignor to Dai Nippon Toryo Kabushiki Kaisha, Japan

Filed Oct. 31, 1973, Ser. No. 411,414

Claims priority, application Japan, Nov. 2, 1972, 47-126262; Dec. 20, 1973, 48-2338

Int. Cl.² G08B 5/36

U.S. Cl. 340—336 **10 Claims**



1. A flat display system having a display screen constituted by a planar arrangement of a plurality of individual pattern segments, each in the form of an isosceles triangle with an apex angle of 90°, said individual pattern segments having identical dimensions and being arranged in a plurality of squares each including four substantially juxtaposed pattern segments having their apices located at the center of the respective square; said individual pattern segments being capable of selective and independent display activation to provide a flat display of numerical figures, alphabetical characters, and other symbols and patterns, in an easily discernible form, on said display screen.

3,936,817

THERMOELECTRIC DISPLAY DEVICE

Sidney Levy, Oaklyn, N.J., and Abraham Friedman, Brooklyn, N.Y.

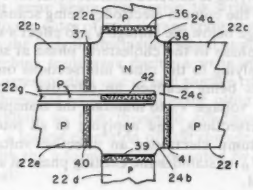
Filed June 6, 1974, Ser. No. 476,927

Int. Cl.² G02F 1/18

U.S. Cl. 340—336 **8 Claims**

1. A visual display device comprising a thermoelectric element having a surface which exhibits a reversible temperature

which is a function of magnitude and direction of a current passing through said element, a liquid crystal material disposed on said surface in thermally conductive relation therewith, said liquid crystal material being variable between different optical states as a function of temperature to which said liquid crystal is exposed, each optical state which the display device exhibits being a function of the magnitude and direction of the current passing through said thermoelectric element, said thermoelectric element including two dissimilar conductors disposed in overlapping relationship to provide predetermined areas defining a junction, said surface being a part of one of said conductors and being substantially coextensive with said predetermined area defining said junction so



that regulation of the current through said junction controls the temperature at said surface and the optical state of said liquid crystal material, a heat sink being connected to each conductor in a thermally conductive relation therewith at a point remote from said junction to permit flow of heat therebetween, said conductors being fabricated from semi-conductor materials, one conductor being a p-type semi-conductor and the other conductor being an n-type semi-conductor, whereby reversal of the current through said junction provided by said p-type and n-type semi-conductors effects a change in thermal characteristic of said junction between a heat generating system and a heat absorbing system to raise and lower the temperature of said surface.

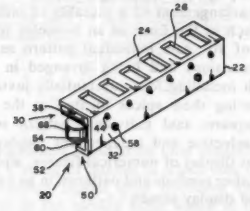
3,936,818
ELECTROMAGNETIC INDICATOR HAVING OPPOSITELY MAGNETIZED STAMPED MAGNETIC CORES

Alfred Skrobisch, Huntington, N.Y., assignor to The Staver Company, Incorporated, Bay Shore, N.Y.

Continuation of Ser. No. 381,880, July 23, 1973, abandoned. This application July 15, 1974, Ser. No. 488,465

Int. Cl.[2] G08B *5/24*

U.S. Cl. 340—373 **11 Claims**



1. An electromagnetic indicator assembly, comprising:

a support frame for displaying symbols;

a plurality of permanently magnetized rotors carried by said frame in laterally spaced axially parallel position, with each of said rotors carrying a symbol for display at said frame; and

a stator assembly carried by said frame and comprising:

a stamped magnetic metal plate having a plurality of laterally spaced fingers each defining a magnetic core which terminates close to one of said rotors, and

a plurality of stator coils each axially mounted on one of said cores for magnetizing the same when said coil is energized electrically to cause rotation in one direction of the adjacent rotor and displaying of said symbols carried thereon.

3,936,819
AMPLIFIER FOR ANALOGUE SIGNAL SAMPLES WITH AUTOMATIC GAIN CONTROL, AND CIRCUIT FOR DIGITISATION OF SUCH SAMPLES

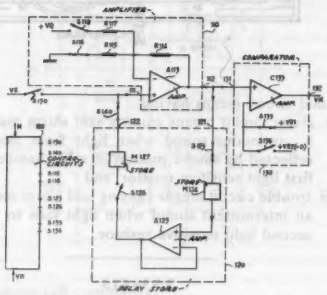
Philippe Angelle, Thouare, and Georges Lefevre, Nantes, both of France, assignors to Societe D'Etudes, Recherches Et Constructions Electroniques Sercel, Carquefou, France

Filed Jan. 10, 1973, Ser. No. 322,333

Claims priority, application France, Jan. 11, 1972, 72.00799

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 AD **28 Claims**



1. An electronic device for floating point digitisation of samples of analogue signals of constant definite polarity, comprising:

amplifier means operative in a first state with a first predetermined gain from a signal input to an output, and in a second state for selectively supplying on its output either the difference between its signal input amplified by a second gain and a quantification value, or only its signal input amplified by said second gain, depending upon a polarity control;

delay means having an input and an output adapted to be coupled to said output and said signal input of the amplifier means, respectively, for controllably re-circulating the output thereof after a time interval as a signal input to be re-amplified by the amplifier means;

comparator means coupled to the output of the amplifier means and operative in first and second states for indicating when the output of the amplifier means exceeds first and second reference values, respectively; and

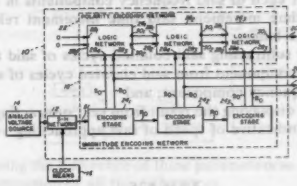
control means, effective upon application of a sample of an analogue signal to said signal input of the amplifier means, for operating said amplifier means and said comparator means in their respective first states, while repetitively controlling said delay means to re-circulate the output of the amplifier means unless said comparator means indicates that the output of the amplifier means exceeds the first reference value, and for subsequently operating said amplifier means and comparator means in their respective second states, while repetitively controlling said delay means to re-circulate the output of the amplifier means a selected number of times and each time supplying to said amplifier means a polarity control depending upon the indication of said comparator means.

3,936,820

ANALOG-TO-DIGITAL CONVERTER

Bertram J. Goldstone, Lexington, and John Memishian, Jr., Arlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 27, 1974, Ser. No. 483,502
Int. Cl.² H03K 13/02
U.S. Cl. 340—347 AD 5 Claims



1. In an analog-to-digital converter adapted to operate over a range of analog signal levels, such converter including a series of cascade-coupled encoding stages, a first one of such stages having applied thereto an analog signal to be converted, each one of such stages being adapted to operate over the range of analog signal levels and including means for producing a digital output signal in accordance with the magnitude of the analog signal applied to such stage and, means for producing a residue analog signal in accordance with the analog signal applied to such stage and for applying such residue analog output signal to the succeeding encoding stage, such means having a linear transfer characteristic in the middle region of the operating range of the stage, the improvement characterized by such residue analog signal producing means comprising:

a. a pair of amplifiers, each one thereof having a pair of input terminals and an output terminal;

b. a pair of reference voltage souces, each one thereof being coupled to one of the pair of input terminals of a corresponding one of the pair of amplifiers;

c. a pair of diodes having one electrode thereof coupled to a corresponding one of the pair of output terminals and a second electrode coupled to a first junction, such junction being coupled to the succeeding encoding stage; and,

d. a pair of resistors serially connected between the first junction and the input terminal of the encoding stage, the second one of the pair of input terminals of the amplifiers being connected at a junction between such resistors.

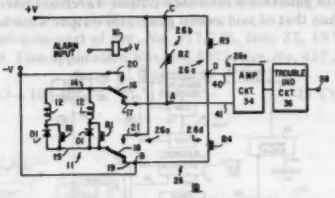
3,936,821

SUPERVISORY CIRCUIT FOR PARALLEL CONNECTED DEVICES

Glenn F. Cooper, West Springfield, and Daniel J. Marceau, Springfield, both of Mass., assignors to Standard Electric Time Corporation, Springfield, Mass.

Filed May 15, 1974, Ser. No. 470,063
Int. Cl.² G08B 23/00
U.S. Cl. 340—409 13 Claims

1. In a circuit having a plurality of functional devices at least some of which are connected in parallel between a pair of conductors for enabling energization of said functional devices, a supervisory circuit for supervising continued operability of each of said functional devices comprising a plurality of impedance means each individually connected in series with a different one of said functional devices between said conductors, each of said impedance means including a first circuit means connecting the corresponding functional device in a first circuit path between said conductors to provide an energizing path of a first impedance for enabling operation of the functional device and a second circuit means connecting the functional device in a second circuit path between said conductors to provide a supervisory path of a higher impedance indicative of the operability of the functional device for enabling supervision of the operability of the functional device,



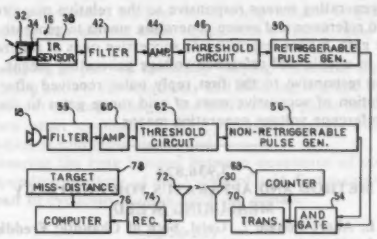
and means connected to said circuit and operable in the event of an impedance change in at least one of said supervisory paths to provide an output indicative of the inoperability of at least one of said functional devices.

3,936,822

METHOD AND APPARATUS FOR DETECTING WEAPON FIRE

Kenneth A. Hirschberg, 13866 Espada Court, Saratoga, Calif. 95070

Filed June 14, 1974, Ser. No. 479,225
Int. Cl.² G08B 17/12
U.S. Cl. 340—420 13 Claims



1. A method of detecting the occurrence of only an event which occurs at known distances from signal transducers, which event produces first and second signals having different velocities of propagation, such as electromagnetic and acoustic signals, which method comprises,

locating at known distances from the event to be detected first and second transducers for detecting said first and second different velocity signals produced as a consequence of said event to be detected,

generating in response to detected first and second signals received by said transducers first and second pulses having simultaneously existing portions when the first and second signals are produced as a consequence of said event to be detected, and

producing a signal upon simultaneous existence of said first and second pulses to indicate the detection of the occurrence of the event to be detected.

3,936,823

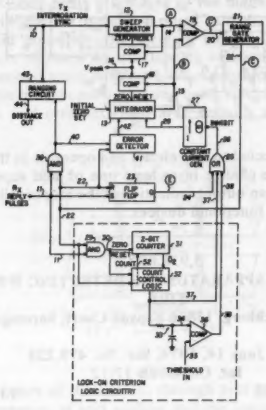
FAST SEARCH AND LOCK-ON MEANS FOR DISTANCE MEASURING EQUIPMENT

Charles A. Weber, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 1, 1974, Ser. No. 494,262
Int. Cl.² G01S 9/14, 9/56
U.S. Cl. 343—7.3 10 Claims

1. In an electronic ranging system, means for generating a range gate in time synchronism with replies to successive transmitted pulses, comprising voltage sweep generating

means responsive to the time occurrence of an initial and subsequent ones of said transmitted pulses to generate a sweep output waveform having a predetermined slope, reference voltage generating means responsive to an initial transmitted pulse to generate a reference output waveform having a slope less than that of said sweep generator output waveform, range



gate generating means responsive to the relative magnitudes of said reference and sweep generating means to generate said range gate, means responsive to successive ones of said range gates to enable said reference voltage generating means, and means responsive to the first reply pulse received after the generation of successive ones of said range gates to disable said reference voltage generating means

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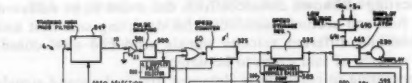
3,936,824
METHOD AND APPARATUS FOR DIGITALLY MEASURING SPEED

John L. Aker; Donald L. Geist, both of Chanute; Freddie R. Kittle, Savonburg, and Fred M. Berry, Leawood, all of Kans., assignors to Kustom Electronics, Inc., Chanute, Kans.

Filed May 18, 1973, Ser. No. 361,822
Int. Cl.² G01S 9/46
U.S. Cl. 343—8 **20 Claims**



1. A doppler radar device for use in law enforcement and service vehicle speed surveilance and for determining the speed of an approaching target vehicle when the radar platform vehicle is either moving or stationary, said device comprising:

means for producing a continuously running time base;

a single means for receiving a composite doppler signal having components relating to the speed of said target vehicle and the speed of the radar platform vehicle;

means for separating said doppler frequency into a first frequency component and a second frequency component;

means for correlating the frequency of said first frequency component with said time base;

means for correlating the frequency of said second frequency component with said time base;

means for counting cycles of each of said time base correlated frequency components, said correlating means and said frequency component counting means cooperating to count each of said frequency components in a preselected time increment, said time increment relating to said time base;

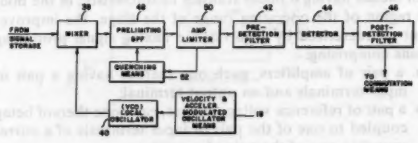
means for subtracting said counted cycles of said first frequency component from said counted cycles of said second frequency component; and

means for displaying the result from said subtracting means in unit indicative of speed of said approaching vehicle.

3,936,825
COMBINED CONTIGUOUS FILTER AND ACCELERATION AND VELOCITY ANALYZER FOR RADAR

Garold K. Jensen, Alexandria, Va., and James E. McGeogh, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 16, 1971, Ser. No. 154,234
Int. Cl.² G01S 9/44
U.S. Cl. 343—9 **5 Claims**



1. In each velocity-and-acceleration analyzer of an O-T-H radar of the parallel range bin type, each said analyzer comprising a mixer, a local oscillator, a velocity-and-acceleration modulated oscillator means, a predetection filter, a detector and a post-detection filter, a single filter means comprising:

prelimiting filter means connected to receive the output of said mixer for filtering; and

amplifying and limiting means connected to receive the output of said prelimiting filter for amplifying and limiting the output of said prelimiting filter and for providing its output to said predetection filter,

said velocity-and-acceleration modulated oscillator means driving said local oscillator to provide sets of frequency-swept signals to said mixer which serially sweep through narrow contiguous frequency channels, the complete set of frequency channels covering the entire doppler frequency bandwidth.

3,936,826
N DIMENSIONAL TARGET DESIGNATION VECTOR

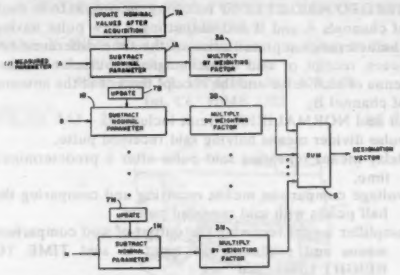
James W. Hoffman, Palos Verdes Estates, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 19, 1974, Ser. No. 490,167
Int. Cl.² G01R 17/02; G01S 9/02
U.S. Cl. 343—5 SA **5 Claims**

1. In a detection system a method for evaluating received parameters from an object comprising the steps of:

separating the different parameters of the object to be evaluated;

subtracting from each parameter an amount equal to the normal parameter of a ideal return from a true target; and

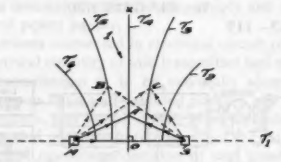


combining the difference of these parameters so as to obtain a summation of all the differences.

3,936,827
SECURE HYPERBOLIC GUIDANCE USING NOISE SIGNALS AND CORRELATION DETECTION

Joseph J. Albert, Timonium, Md., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed May 22, 1956, Ser. No. 586,538
Int. Cl.² G01S 1/30
U.S. Cl. 343—105 R 16 Claims



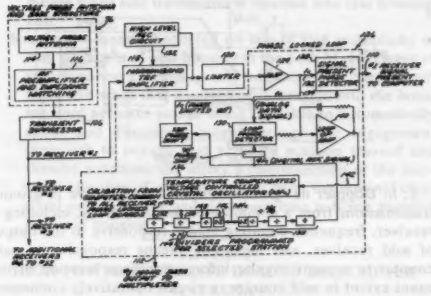
1. A method for use in controlling the flight of an aircraft which includes radiating from two base stations respectively a first noise signal and a second noise signal identical to said first noise signal but at a slightly different frequency and at a controlled interval with respect thereto, receiving both of said signals at said aircraft, simultaneously deriving at said aircraft a first oscillating voltage related to the envelope of the correlation function of said signals at a first delay time therebetween and a second oscillating voltage related to said envelope of said correlation function of said signals at a second delay time therebetween, subtracting said voltages to yield a difference voltage, and utilizing said difference voltage to control the airfoils of said aircraft.

8. An air-borne system for controlling an aircraft in response to a pair of controlled radiated noise signals whenever the aircraft containing said system drifts from a path yielding a predetermined time delay between said signals, comprising an antenna, a receiver having its input connected to said antenna, a pair of correlators having one input of each connected to the output of said receiver, a first delay means having its input connected to said output of said receiver and its output connected to the remaining input of one of said correlators, a second delay means having its input connected to said output of said receiver and its output connected to the remaining input of the remaining one of said pair of correlators, a pair of detectors having their inputs connected respectively to the outputs of said pair of correlators, a pair of filters having their inputs connected respectively to the outputs of said detectors, means joining a like polarity terminal of each of the outputs of said filters, and a utilization means having its input connected to the remaining terminals of said outputs of said filters.

3,936,828
VLF NAVIGATION SYSTEM

Allen R. Muesse, Orange, and Jess C. Wright, El Cajon, both of Calif., assignors to Communications Components Corporation, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 317,738, Dec. 22, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,384
Int. Cl.² G01S 1/30
U.S. Cl. 343—105 R 73 Claims

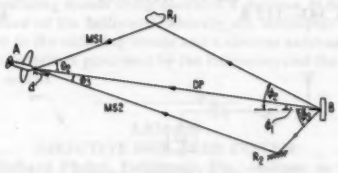


68. The navigation method which comprises the steps of:
receiving at least one radio signal from a distant radio station;
developing a pair of cyclically varying electrical signals having known like frequency and differing in phase by an amount corresponding to the difference in phase between two other cyclically varying electrical signals one of which is said radio signal; and
measuring the time interval between occurance of corresponding portions of the cycles of said first-mentioned pair of cyclically varying electrical signals.

3,936,829
METHOD OF RADIO NAVIGATION

Francis G. Overbury, Washington, D.C., assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 5, 1974, Ser. No. 529,989
Claims priority, application United Kingdom, Dec. 6, 1973, 56513/73
Int. Cl.² G01S 1/38
U.S. Cl. 343—106 R 6 Claims



1. A method of determining, at the site of a radio beacon, the location of any beacon signal reflecting objects, in which method the beacon is caused to transmit a directionally coded signal over a given service sector, in which during said signal transmission a radio receiver is moved towards said beacon along a predetermined path in said sector, in which during said movement all beacon-derived signals received by the receiver are recorded in a form such as to be coded at least in respect of beacon related bearings and receiver related bearings, and in which said recorded signals are individually isolated in such a manner as to permit identification and location of any of said reflecting objects.

3,936,830

DOPPLER NAVIGATION SYSTEM WITH TRACKING FILTER FOR MULTIPATH DISCRIMINATION

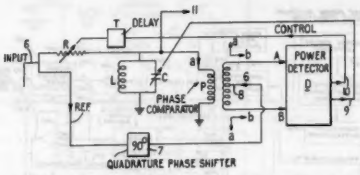
Francis G. Overbury, Cuffley, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 1, 1974, Ser. No. 465,861

Claims priority, application United Kingdom, May 10, 1973, 22291/73

Int. Cl.² G01S 5/02

U.S. Cl. 343—113 DE **6 Claims**



1. In Doppler navigation equipment responsive to ground transmissions from a commutated antenna array, including a receiver, frequency counting means responsive to the output of said receiver, and indicating means responsive to said counter to present angular information as a function of the count extant in said counter, a circuit operatively connected between said receiver and said counter comprising:

a filter circuit in the signal path from said receiver to said counter, said filter circuit comprising a resonant frequency controllable LC circuit substantially in parallel with the output terminals of said filter circuit, and a controllable value resistance in series with the signal path from the input terminal of said filter to said filter output terminal;

and first means for comparing the output of said filter with the frequency spectrum of signals at the output of said receiver to produce and apply a control signal to said LC circuit and to said controllable resistance to cause the center frequency to vary toward the frequency of the maximum power spectral line and to also narrow the passband of said filter, thereby to tend to eliminate signal energy corresponding to multipath reception.

3,936,831

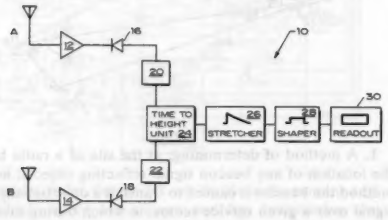
SINGLE PULSE TO A MEASUREMENT SYSTEM

Gerald N. Jones, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1971, Ser. No. 210,265

Int. Cl.² G01S 3/50

U.S. Cl. 343—113 R **6 Claims**



1. A system for finding the direction of an emitter of electromagnetic pulses comprising:

first receiving means including a first antenna connected to circuitry means defining a CHANNEL A;

second receiving means including a second antenna spaced from said first antenna and connected to circuitry means defining a CHANNEL B;

each said channel including a NORMALIZER circuit unit receiving electromagnetic pulses from said antenna and having an output;

A TIME TO HEIGHT UNIT receiving the output from each of channels A and B and outputting a new pulse having characteristics representative of the time difference between receipt of said electromagnetic pulse at the antenna of channel A and the receipt thereof at the antenna of channel B;

each said NORMALIZER circuit including;

pulse divider means halving said received pulse,

delay means repeating said pulse after a predetermined time,

voltage comparison means receiving and comparing the half pulses with said repeated pulses,

amplifier means receiving the output of said comparison means and producing an input to said TIME TO HEIGHT UNIT; and

readout means responsive to said new pulse providing a readout based on said time difference and indicative of the direction of the emitter with respect to a reference.

3,936,832

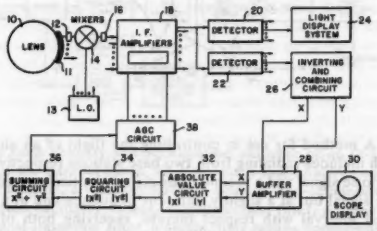
SYSTEM TO PROCESS ANTENNA BEAMS TO OBTAIN THE ANGULAR LOCATION OF TARGET WITH HIGH RESOLUTION AND ACCURACY

Marvin C. Behnke, deceased, late of Hermosa Beach, Calif., by Rita Behnke, legal representative, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,719

Int. Cl.² G01S 3/30

U.S. Cl. 343—119 **11 Claims**



1. A system to process antenna beams to obtain target angular location comprising:

a plurality of antennas disposed to provide overlapping output beams, thus providing complete coverage of some predetermined sector of area;

mixing means for providing an I.F. signal from the output from each of said plurality of antennas;

a plurality of first detector means, a different one for each one of said I.F. signals developed at said mixing means;

comparison means to which the detected I.F. signals from each of said first detector means are applied for determining which of the I.F. signals from said plurality of antennas has the largest amplitude signal and thus the strongest target signal and displaying this information on a first display means;

a plurality of second detector means, a different one for each one of the I.F. signals developed at said mixing means;

inverting and combining means to which the detected I.F. signals from said second detector means are applied, said inverting and combining means selectively inverting and serially combining the I.F. signals from alternate antennas so that at least two approximate sine-waves are formed;

second display means to which the two sine-waves are applied to vary the coordinates of the response in said display means in accordance therewith so that the antenna beam azimuth across which the target travels is expanded

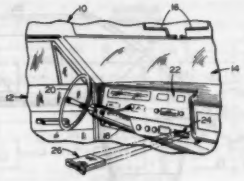
such that the target location within a particular beam can be determined very accurately.

3,936,833

GARAGE DOOR RADIO CONTROL TRANSMITTER ASSEMBLY

Walter R. Bush, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed June 12, 1974, Ser. No. 478,640
Int. Cl.² H04B 1/03
U.S. Cl. 343—225 10 Claims



1. A garage door radio control transmitter assembly for use with a motor vehicle having an instrument panel comprising:

a. a garage door radio control transmitter having a first operating condition and a second operating condition, said transmitter embodying electrical cirrcuitry operable when said transmitter is in said first operating condition to produce and transmit a signal receivable by a cooperating receiver located in spaced relation to said transmitter, said transmitter being operable to be powered selectively from an internal electrical power supply and an external electrical power supply;

b. switch means connected in electrical circuit relation with the electrical circuitry of said transmitter and mounted on said transmitter so as to be externally accessible, said switch means having an actuated position and an unactuated position, said switch means being operable when in said actuated position thereof to effect the establishment of said first operating condition of said transmitter and being operable when in said unactuated position thereof to effect the establishment of said second operating condition of said transmitter;

c. disconnect means connected in electrical circuit relation with the electrical circuitry of said transmitter and mounted on said transmitter so as to be externally accessible, said disconnect means having an unactuated position and an actuated position, said disconnect means being operable when in said unactuated position thereof to permit said transmitter to derive electrical power from the internal electrical power supply and being operable when in said actuated position thereof to disconnect the electrical circuitry of said transmitter from the internal electrical power supply;

d. first terminal means connected in electrical circuit relation with the electrical circuitry of said transmitter and mounted on said transmitteer so as to be externally accessible, said first terminal means being operable for establishing an electrical connection between the electrical circuitry of said transmitter and the external electrical power supply;

e. a housing formed on the instrument panel of the motor vehicle, said housing comprising a multiplicity of wall members interconnected together to form a receptacle having one open wall, said housing having internal dimensions greater than the external dimensions of said transmitter and having an internal configuration conforming to the external configuration of said transmitter to permit said transmitter to be inserted into said housing through said open wall;

f. second terminal means mounted on one of said multiplicity of wall members of said housing in the path of movement of said first terminal means of said transmitter and connectible to said first terminal means of said transmitter when said transmitter is inserted into said housing to effect an electrical circuit connection between said first and second terminal means;

g. conductor means having one end thereof connected in electrical circuit relation with said second terminal means and the other end thereof connected in electrical circuit relation in the electrical system of the motor vehicle, said conductor means being operable for connecting the electrical circuitry of said transmitter in electrical circuit relation with the external electrical power supply consisting of the electrical system of the motor vehicle through the interconnection of said first and second terminal means when said transmitter is inserted into said housing; and

h. actuator means supported on one of said multiplicity of wall members of said housing in the path of movement of said disconnect means on said transmitter for engagement therewith when said transmitter is inserted into the housing, said actuator means being operable to automatically cause said disconnect means through the engagement therewith to occupy said actuated position thereof and thereby automatically effect a disconnection of the electrical circuitry of said transmitter from the internal electrical power supply as said transmitter is being inserted into said housing.

3,936,834

HIGH POWERED FERRITE LOADED HELICOPTER ANTENNA

Lucio M. Vallese, Glen Ridge, N.J.; Gordon L. Clark, Takoma Park, and James C. Bailey, Hollywood, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1972, Ser. No. 266,524
Int. Cl.² H01Q 1/28
U.S. Cl. 343—708 5 Claims

1. An antenna system mounted upon the side of a helicopter comprising:

means for feeding a signal to and from a transmitter and receiver;

radiating means having a ferrite loading connected to said feeding means, said radiating means including a vertically aligned rod encased in ferrite material;

said radiating means being mounted a distance D from the surface of the helicopter whereby the helicopter is coupled to the radiating means and a circular antenna radiation pattern is generated by the helicopter and the radiating means.

3,936,835

DIRECTIVE DISK FEED SYSTEM

Harry Richard Phelan, Indialantic, Fla., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 26, 1974, Ser. No. 454,910
Int. Cl.² H01Q 19/16, 21/26
U.S. Cl. 343—753 21 Claims

1. A multiple-beam antenna comprising a collimating means for redirecting electromagnetic energy; and a feed array including a feed-system ground plane, a plurality of element antennas spaced apart 0.7 to 0.9 wavelength for illuminating said collimating means by respective feed energy paths, each of said feed element antennas having a primary radiator spaced about one-fourth wavelength from said ground plane and a generally circular director, said director being disposed on and transverse to the respective feed energy path and about

one-quarter wavelength from the respective primary radiator and proportioned for mutual electric and magnetic coupling with others of said directors for inducing parasitic radiation to

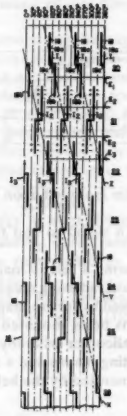
produce a substantially angular sector-shaped feed radiation pattern when one respective primary radiator is directly excited in array.

3,936,836

Z SLOT ANTENNA

Myron S. Wheeler, Baltimore, and Hall R. McComas, Laurel, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 25, 1974, Ser. No. 491,916
Int. Cl.² H01Q *13/12*
U.S. Cl. 343—771 **5 Claims**



1. An antenna assembly comprising a coaxial transmission line having inner and outer coaxial conductors, said outer conductor having a plurality of radiating slots spaced circumferentially of said line, said slots extending longitudinally of said outer conductor and including respective coupling sections which extend transversely of said line to provide coupling apertures to current on said line,

said plurality of slots being arranged in bays, each of said bays being composed of a plurality of slots having respective coupling sections lying in the same plane transverse to the longitudinal axis of said transmission line,

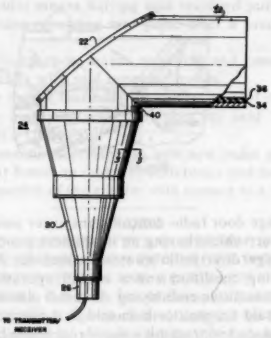
adjacent bays of radiating slots being angularly displaced with respect to individual radiating slots of the respective bays for improving the omnidirectional coverage of the pattern of said antenna assembly.

3,936,837

CORRUGATED HORN FED OFFSET PARABOLOIDAL REFLECTOR

H. Paris Coleman, Alexandria, Va.; Russell M. Brown, Bethesda, and Billy D. Wright, Oxon Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1975, Ser. No. 552,907
Int. Cl.² H01Q *15/16*
U.S. Cl. 343—781 **5 Claims**



1. A high frequency antenna system for radiating and receiving electromagnetic energy comprising:

a feed-horn having corrugations disposed on the interior conducting surface thereof;

parabolic reflective means disposed opposite the open end of said feed-horn for reflecting spherical wave-front energy radiated from said corrugated feed-horn and for converting the energy into plane-wave-front energy, and wherein said feed-horn is disposed so that none of the plane-wave-front energy is intercepted by said feed-horn;

whereby said corrugations cause low edge illumination of energy from said feed-horn incident on said parabolic reflective means;

and further wherein said feed-horn has a feed element located at the origin of an orthogonal x, y, z, axis reference system, the axis of the horn coinciding with the x axis, said feed-horn having an angle α between the feed-horn interior surface and the x axis and a length $2F(k^2-1)^{1/2} - (2FK)$; and

said parabolic reflective means having a parabolic surface satisfying the equation $x^2 + y^2 = 4F(z + F)$ where F is the focal length of said parabolic surface, and K is equal to $\tan\alpha$;

wherein spherical energy radiating from said feedhorn is converted to plane wavefront energy traveling in the direction of the x axis.

3,936,838

MULTIMODE COUPLING SYSTEM INCLUDING A FUNNEL-SHAPED MULTIMODE COUPLER

Peter Foldes, Montreal, Canada, assignor to RCA Corporation, New York, N.Y.

Filed May 16, 1974, Ser. No. 470,574
Int. Cl.² H01Q *13/00*; G01S *9/22*
U.S. Cl. 343—786 **23 Claims**

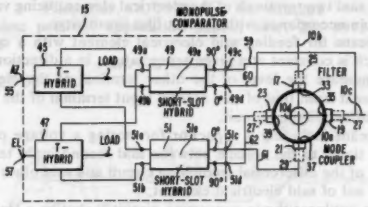
1. A coupling system for symmetrical mode signals and asymmetrical mode signals comprising:

a hollow truncated cone shaped member having tapering side walls and two orthogonal symmetry planes and a first opening at one end and a larger opening at the opposite end, said first opening at one end adapted to present a low reflection coefficient coupling path to symmetrical mode signals,

an asymmetrical mode signal terminal,

first and second coupling apertures in the tapering side wall of said hollow member with said first and second side wall apertures at diametrically opposite surfaces of said member in one of said symmetry planes,

third and fourth coupling apertures in the tapering side wall of said hollow member with said third and fourth side wall apertures at diametrically opposite surfaces of said member in the second of said orthogonal symmetry planes,



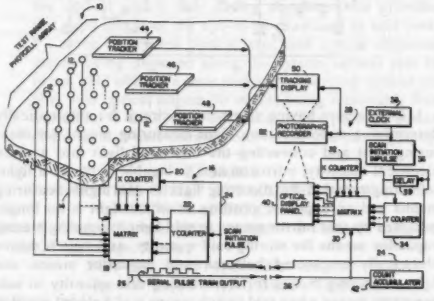
and coupling means coupled between said first, second, third and fourth apertures and said asymmetrical mode signal terminal characterized by a response to signals at said terminal for coupling equal portions of the signal energy at the terminal to said first, second, third and fourth apertures with the phase of the coupled signals at the first and third apertures being advanced 90° relative to the phase of the signals at the second and fourth apertures.

3,936,839

METHOD AND SYSTEM FOR MONITORING THE LIGHT OUTPUT OF PYROTECHNIC LUMINANTS UNDER DYNAMIC CONDITIONS

Wahner E. Brooks, Yuma, Ariz., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1975, Ser. No. 567,897
Int. Cl.² G01D *9/00, 9/42;* **H01J** *39/12*
U.S. Cl. 346—1 **5 Claims**



1. A method of monitoring the light output of pyrotechnic luminants under dynamic conditions to obtain data representative of ground surface illumination as a function of time and position of the illumination source, said method comprising the steps of:

disposing an array of spaced-apart light sensing means at substantially ground level throughout a range testing area;

firing a pyrotechnic luminant-containing projectile over the range testing area to commence a testing period;

sequentially scanning each light sensing means to provide serial electrical data representative of the output of each light sensing means in response to the pyrotechnic illumination characteristics;

receiving the electrical data at a location remote from the range testing area;

sequentially demodulating the received electrical data and converting same into an optical display synchronously with said scanning in a pattern simulating the illumination impinging on the array of light sensing means throughout the range testing area;

simultaneously tracking the position of the projectile over the range testing area and providing a display representative of acquired tracking information; and

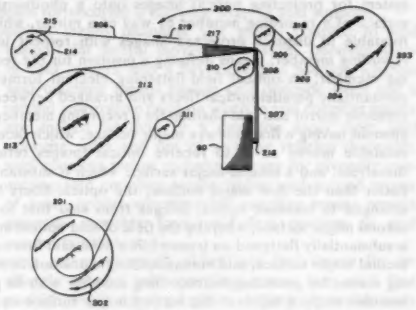
recording the illumination display pattern in correlation with the tracking information display.

3,936,840

RECORDING SYSTEM USING CARBON-PAPER

Werner Buckreus, Stockdorf, Munich, Germany, assignor to Fritz Schwarzer, GmbH, Munich, Germany

Filed Mar. 22, 1974, Ser. No. 453,625
Int. Cl.² G01D *15/00*
U.S. Cl. 346—32 **1 Claim**



1. A system for recording at least one electrical signal, said system comprising means for amplifying said signal thereby generating an amplified signal, means for applying said electrical signal to an input of said amplifying means, electromechanical means including a rotatable shaft for registering the output of said amplifying means, optical feedback means including an optical mask with apertures affixed to said shaft for generating feedback light signal pulses whose sum is related to angular displacement of said shaft and to amplitude of said electrical signal, means for detecting said feedback light signal pulses, means including a forwards-backwards counter and a digital/analog converter for counting said feedback light signal pulses and converting said sum to an analog feedback electrical signal, said amplifying means including means for comparing said analog feedback electrical signal and said amplified signal for generating said output of said amplifying means, said electro-mechanical means further comprising: chart paper, carbon paper in controllably-operative contact with said chart paper, the thickness of said carbon paper being substantially less than the thickness of said chart paper, galvanometer pen means responsive to said rotatable shaft for contacting and applying controlled pressure to said carbon paper thereby finely scribing on said chart paper along paths representative of said fluctuations, means for steadily moving said chart paper transverse to directions of said paths thereby generating an effective time axis for recording a representation of said electrical signal on said chart paper, and means for moving said carbon paper in a direction opposite to the direction of motion of said chart paper.

3,936,841

PHOTOCOMPOSING APPARATUS

Josef Maria Herbert Tiefenthal, Surrey, England, assignor to The Monotype Corporation, Limited, London, England

Filed Sept. 26, 1973, Ser. No. 400,826

Claims priority, application United Kingdom, Oct. 2, 1972, 45296/72

Int. Cl.² G03B 23/00

U.S. Cl. 354—10 6 Claims

1. In a photocomposing apparatus comprising a projection system for projecting optical images onto a photosensitive surface of a recording member by way of a mirror, which is rotatable to displace projected images with respect to the recording member; means defining a position for the recording member; an optical field-flattening element formed by substantially parallel optical fibers and arranged berween the rotatable mirror and said position for a recording member, the element having a first concave major surface, which faces the rotatable mirror so as to receive optical images reflected therefrom, and a second major surface which is substantially flatter than the first major surface, the optical fibers being arranged to transmit optical images from said first to said second major surface, whereby the field of said optical images is substantially flattened on transmission from said first to said second major surface, said means defining a position comprising means for retaining the recording member with its photsensitive surface adjacent the second major surface and the axis of rotation of the mirror being at the effective center of curvature of the first major surface.

3,936,842

AUTOMATIC EXPOSURE TIME CONTROL CIRCUITRY FOR A CAMERA USING A PHOTODIODE AS A LIGHT MEASURING ELEMENT

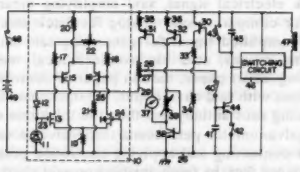
Yasuhiro Nanba, Sakai, and Motonobu Matsuda, Izumi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 21, 1974, Ser. No. 481,811

Claims priority, application Japan, June 23, 1973, 48-70465

Int. Cl.² G03B 7/08; G01J 1/44

U.S. Cl. 354—24 6 Claims



1. An automatic exposure time control device for a camera comprising:

a high input impedance differential amplifying circuit having first and second input terminals and an output terminal;

a photodiode connected between said first and second input terminals;

a logarithmic compressing diode connected from said output terminal to said first input terminal for providing negative feedback, whereby a voltage proportional to the logarithm of the light intensity detected by said photodiode is produced between said output terminal and said second input terminal;

an electrical element having two terminals one of which is connected to said output terminal, the resistance between said two terminals of the electrical element being variable in accordance with at least film sensitivity;

means for feeding said electrical element with a current, which is constant at a given temperature, in a direction so as to increase the level of the other terminal of the electrical element from that of said second input terminal of the differential amplifying circuit;

means including a capacitor for storing a voltage proportional to the voltage between said second input terminal of the differential amplifying circuit and said other terminal of said electrical element;

an antilogarithmic converting circuit including a transistor having an emitter, a collector and a base for generating a collector current proportional to the antilogarithm of the base-emitter voltage, said capacitor being connected between said base and emitter; and

means for integrating said collector current to control the exposure time.

3,936,843

CAMERA WITH OPTIONALLY OPERABLE MANUAL CONTROLS

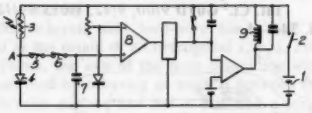
Hiroshi Kurei, Kawagoe; Fumio Urano, Omiya, and Katsuhiko Nomura, Kawagoe, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,807

Claims priority, application Japan, Dec. 30, 1972, 48-456; Dec. 30, 1972, 48-457

Int. Cl.² G03B 7/08

U.S. Cl. 354—51 8 Claims



1. In a camera having an electrical circuit for automatically determining exposure time, light-measuring means for measuring light and converting the measured light into a given electrical quantity, mirror means swingable between a light-reflecting position for directing light to said light-measuring means and an exposure position in which light is no longer reflected by said mirror means to said light-measuring means, capacitor means for storing said quantity, and switch means electrically connected between said capacitor means and light-measuring means for transmitting said quantity to said capacitor means when said switch means is in a closed position and for assuming an open position prior to exposure so that said capacitor means will retain and store said quantity even if light is not received by said light-measuring means at the instant of and just prior to exposure, said capacitor means, switch means, and light-measuring means forming part of said circuit, automatic means operable during normal exposures for automatically opening said switch means and displacing said mirror means to said exposure position thereof, and manually operable means accessible at the exterior of the camera and operatively connected with said switch means for manually opening said switch means at the option of the operator independently of said automatic means while the latter remains inoperative, said manually operable means remaining in

a predetermined rest position when said automatic means operates during normal exposures for automatically opening said switch means and displacing said mirror means to said exposure position thereof.

3,936,844

EYE-FUNDUS CAMERA EASY FOR ALIGNMENT OF PUPIL

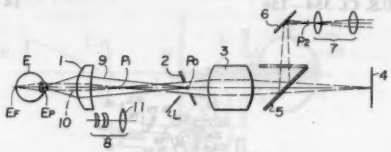
Isao Matsumura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Mar. 18, 1974, Ser. No. 452,252

Claims priority, application Japan, Mar. 22, 1973, 48-33745

Int. Cl.² G03B 29/00

U.S. Cl. 354—62 7 Claims



1. An optical system for observation and photography of the eye-fundus in an eye-fundus camera, said system providing simplified pupil alignment, comprising:

an eye station for establishing the position of the eye;

an objective lens facing the eye-to-be-examined for forming an eye-fundus image at a point, P_1, along the optical axis of the optical system;

a photographic lens system disposed along the system optical axis on the side of the objective lens away from the eye beyond said eye-fundus image forming point, said photographic lens system for reforming the eye-fundus image formed by the objective lens;

an eye-fundus-observing optical system, receptive to light passed by said photographic lens, for providing a focussed eye-fundus image for observation;

means for providing said reformed image of said eye-fundus to said observing optical system during observation and for providing said reformed image to an image plane during photography; and

and optical alignment means for removable insertion into the optical system only during alignment, for providing the pupil image of the eye-to-be-examined at said point, P_1, along the system optical axis, said optical alignment means being disposed along the system optical axis between said objective lens and said observing optical system, said optical alignment means being removable from a position in the system optical axis to a position outside of the optical axis during observation and photography.

3,936,845

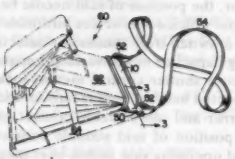
CARRYING STRAP ATTACHMENT FOR A PHOTOGRAPHIC CAMERA

John B. Morse, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1974, Ser. No. 430,070

Int. Cl.² A45C 11/38; G03B 17/02

U.S. Cl. 354—82 18 Claims



1. A carrying strap attachment adapted to be coupled to underlying edges of opposite sides of a photographic camera, said attachment comprising:

a support bar having opposing ends;

means for securing a carrying strap to said support bar;

coupling means including spaced surfaces for engaging the underlying edges;

means extending from said opposing ends of said support bar to form inwardly facing opposing sides of said attachment for receiving the underlying edges therebetween; and

means for pivotally mounting said coupling means in spaced relation upon said extending means, said pivot means being spaced apart by a distance not greater than the spacing between said surfaces of said coupling means thereby providing for pivotal movement upon said extending means of said coupling means from a first operative position wherein said surfaces are engageable with the underlying edges to a second inoperative position wherein said spaced surfaces are out of securing relation with the underlying edges.

10. Photographic apparatus including a photographic camera and a carrying strap attachment constructed of interlocking components to form an assemblage for releasably securing a carrying strap upon said camera, comprising in combination:

a support including a first recess and a second recess subjacent to said first recess;

means for securing a carrying strap to said support;

coupling means including slot means coupled to said support for lateral movement towards opposite sides of said camera into a first operative position wherein said coupling means engage said opposite sides and a second inoperative position wherein said coupling means are moved laterally in a direction away from said opposite sides and out of securing relation therewith, said coupling means including means for pivotally connecting said coupling means within said second recess of said support wherein said coupling means remain pivotally movable from said first position to said second position; and

biasing means disposed within said first recess for resiliently biasing said coupling means into said first position, said biasing means having opposite ends attached to said coupling means within said slot means and operating to secure said coupling means to said support.

3,936,846

BATTERY MAGAZINE IN SINGLE LENS REFLEX CAMERA

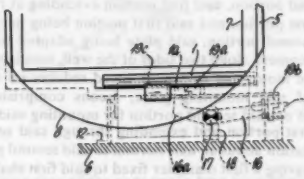
Keisuke Haraguchi, Kamifukuoka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,146

Claims priority, application Japan, Apr. 9, 1973, 48-42629; Apr. 9, 1973, 48-42630

Int. Cl.² G03B 19/12

U.S. Cl. 354—152 7 Claims



1. In a single lens reflex camera including a camera body and a separable objective providing an access opening into

said body upon detachment thereof and a mirror member movable along a predetermined path between a viewing, advanced position and a photographing retracted position, a battery accommodating magazine disposed in said body out of the path of said mirror member and accessible through said opening, and including a magazine cover member movable between a retracted magazine closing position and an advanced magazine open position along a path intercepting said mirror member predetermined path, and interlocking means responsive to the movement to an advanced position of one of said members for preventing the movement to an advanced position of the other of said members.

3,936,847

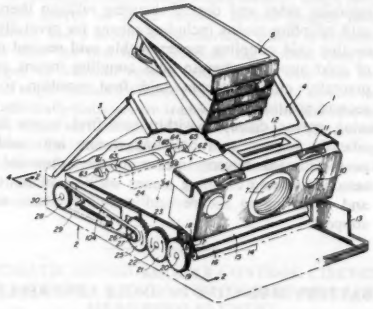
SHAFT DRIVE AND CONTROL SYSTEM FOR AUTOMATIC CAMERA

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 1, 1974, Ser. No. 484,407

Int. Cl.² G03B 19/12

U.S. Cl. 354—152 **7 Claims**



1. A unitary shaft drive and control assembly for use in an automatic camera having a generally rectangular well for receiving a film pack, comprising a first shaft, an electric motor, a two-stage strain wave drive shaft speed reducer connected berween said electric motor and said first shaft, a generally L-shaped mounting plate having a first portion and a second portion, said first portion extending at right angles to said first portion and said first portion being perpendicular to said second portion, said plate being adapted to be mounted in the camera along two sides of the well, means mounting said electric motor and said shaft speed reducer on said first portion of said mounting plate, means comprising a bearing formed on said second portion for mounting said first shaft on said first portion and extending through said second portion for rotation about an axis normal to said second portion, a first gear having a first diameter fixed to said first shaft for rotation therewith, a cam fixed to said first shaft for rotation therewith, a second gear having a smaller diameter than said first gear, means rotatably mounting said second gear on said second portion, a timing belt connecting said first gear to said second gear, and an actuating element connected to said second gear for rotation therewith.

3,936,848

INDEPENDENT MIRROR SWING-UP MEANS IN A SINGLE LENS REFLEX CAMERA WITH MEMORY EXPOSURE DEVICE

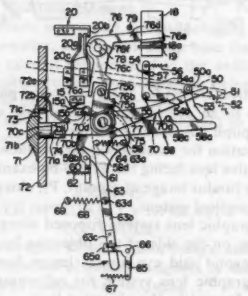
Kazuhiro Akiyama, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 15, 1973, Ser. No. 406,317

Claims priority, application Japan, Oct. 20, 1972, 47-105035

Int. Cl.² G03B 19/12, 7/08

U.S. Cl. 354—156 **14 Claims**



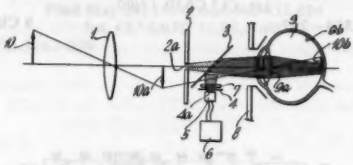
1. In a single lens reflex camera having a focal plane shutter, a mirror automatically swingable from a reflecting position to a folded position by means of an automatic mirror swing up means, in response to the release of the shutter of the camera, a memory type electric shutter control means having a memorizing capacitor and circuit means controlling the operation of the focal plane shutter in the camera, a taking lens, the quantity of light passing through the taking lens being measured by a photoelectric element located in a view finder optical system receiving the light reflected from the mirror, the output of this photoelectric element being connected to said memorizing capacitor in the memory type electric shutter control means, and an electric power supply for the memory type electric shutter control means the improvement comprising: a variable resistor connected across said electrical power supply, means for swinging the mirror to the folded position independently of the release of the shutter, electrical responsive means having a needle movable in response to an electrical potential applied thereto and being connected in parallel with the memorizing capacitor, said needle forming a contact for said variable resistor, the position of said needle being determined by said potential which exists across terminals of the memorizing capacitor, a switch-over means for selectively coupling the memorizing capacitor or the variable resistor to circuit means in the electric shutter control means, locking means operatively connected between said means for independently swinging the mirror and said slidable contact, said locking means fixing the position of said slidable contact on said variable resistor and operating said switch-over means to connect said variable resistor in, and to disconnect said memorizing capacitor from, said circuit means when said means for independently swinging said mirror to its folded position is operated.

3,936,849

DEVICE FOR DETECTING FOCUSSING IN OPTICAL INSTRUMENTS

Kayoshi Tsujimoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1974, Ser. No. 495,962
Claims priority, application Japan, Aug. 9, 1973, 48-89464
Int. Cl.² G03B 3/00
U.S. Cl. 354—195 14 Claims



1. In an optical instrument, a device for detecting focussing conditions comprising:

an objective lens;

an imaginary reference plane predetermined at a position optically equal to a plane on which a real image of an object formed by said objective lens is intended to be focussed;

means for adjusting said objective lens to shift said real image from positions forwardly and rewardly of said reference plane;

a viewing window positioned to permit the eye of an operator of the instrument to view said real image there through; and

means for detecting that said reference plane and the retina of said eye of the operator are optically conjugate to each other with respect to the crystalline lens of said eye which views said real image, whereby indirectly detecting that the position of said real image coincides with said reference plane.

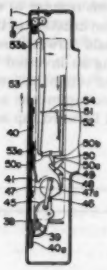
3,936,850

PHOTOGRAPHIC CAMERA EQUIPPED WITH AUTOMATIC FILM TRANSPORTING MECHANISM

Toshio Goto, Omiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 27, 1974, Ser. No. 527,781
Claims priority, application Japan, Nov. 27, 1973, 48-133708
Int. Cl.² G03B 1/32, 1/00
U.S. Cl. 354—212 3 Claims

1. In a photographic camera having a camera body provided at the rear thereof with a hingedly supported back lid for selectively opening and closing a chamber for accommodating therein a photosensitive element on which an image of a subject to be photographed is recorded, said back lid being supported to the camera body by means of a spindle supported in position on said body and within said chamber, a transporting mechanism which comprises a motion transmitter



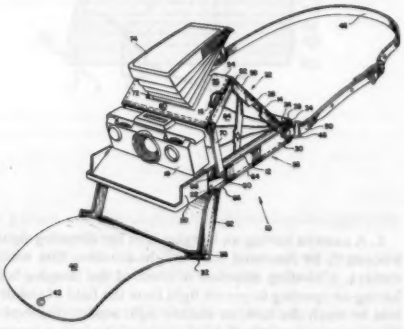
mounted on said spindle, means for transporting said photosensitive element, means for mounting said transporting means within said back lid for movement relative to said back lid, a drive unit built in said camera body, and means for operatively coupling said motion transmitter to said drive unit for transporting said photosensitive element through said transporting means.

3,936,851

EVER-READY CAMERA CASE

Richard R. Wareham, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 26, 1974, Ser. No. 509,693
Int. Cl.² G03B 17/02
U.S. Cl. 354—288 10 Claims



1. A carrying case of the ever-ready type for a photographic camera of the compact collapsible type which is extendible and erectible to a fully operative position in use, said carrying case comprising:

a top portion and a bottom portion transversely hinged to each other near a rear end of said case, said top portion including a transverse hinge dividing said top portion into forward and rear sections and said bottom portion including a transverse hinge dividing said bottom portion into forward and rear sections; and

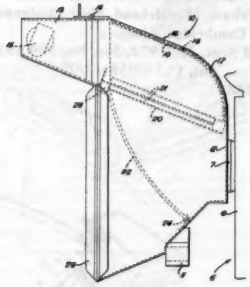
means connecting a forward end of said forward section of said top portion to a forward end of said rear section of said bottom portion, said top portion being movable from a closed position with respect to said bottom portion to an erected position on erection of the camera to its operative position, with said forward and rear sections of said top portion assuming an inverted V-shape configuration which snugly fits and retains erected parts of the camera and with said connecting means adequately spacing said forward end of said forward top section from said lower rear sections.

3,936,852

CAMERA WITH A DEVICE FOR DIRECTING SUPPLEMENTARY LIGHT INTO THE IMAGING LENS

Gerald Leslie Turpin, Knoll Cottage, Fulmer Road, Fulmer, England

Filed Oct. 22, 1974, Ser. No. 517,059
Int. Cl.² G03B *11/00*
U.S. Cl. 354—295 **6 Claims**



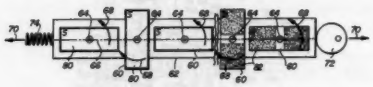
1. A camera having an imaging lens for directing light from a scene to be recorded onto a light sensitive film within the camera, a housing disposed in front of the imaging lens and having an opening to permit light from the field of vision of the lens to reach the lens, an electric light source disposed in the housing outside of the field of vision of the lens, a transparent reflector mounted in the housing in a position in front of the lens such that light from the source is reflected by the reflector through the lens while the light from the scene being photographed passes through the reflector to the lens and at least one coloured filter disposed between the light source and reflector to colour the light directed thereto, wherein the improvement comprises a reflector formed from a curved transparent sheet having a concave reflector surface facing the filter and imaging lens to direct light from the former into the latter and wherein the reflector is formed from clear acrylic plastic.

3,936,853

DEVELOPER APPARATUS FOR LITHOGRAPHIC PLATE PROCESSING SYSTEM

Milam E. Mart, P.O. Box 29, Carrollton, Tex. 75006

Filed June 6, 1974, Ser. No. 476,918
Int. Cl.² G03D *13/00*
U.S. Cl. 354—297 **9 Claims**



1. A lithographic plate processing system comprising:

means for moving an exposed lithographic plate having at least a predetermined width along a predetermined path at a predetermined rate;

means positioned on the path for applying developer to the exposed surface of the lithographic plate;

means positioned on the path for uniformly developing the entire exposed surface of the plate;

said developing means comprising:

a plurality of rectangularly shaped developer spreading members positioned at spaced points along a line extending subtantially transversely to the direction of movement of the lithographic plate along the predetermined path, each said spreading member mounted for engagement with the exposed surface of the lithographic plate, the line of developer spreading members extending completely across the processor, and having a width at least equal to said predetermined width;

means for rotating the developer spreading members about spaced apart axes each extending substantially perpendicularly to the plane of the exposed surface of the lithographic plate;

each of said spreading members extending in both directions from its axis of rotation more than half the distance between adjacent axes so that the paths of rotation of adjacent developer spreading members overlap one another, thereby applying developer uniformly to the entire surface of the plate exposed to the line of said developer spreading members; and

means for simultaneously oscillating all of the rotating developer spreading members along a line extending substantially transversely to the direction of movement of the lithographic plate;

the rate of said oscillation being wholly independent of the rate of movement of the lithographic plate along said predetermined path;

means positioned on the path of movement of the lithographic plate for washing the exposed surface of the plate to remove excess developer therefrom; and

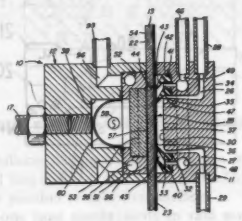
means positioned on the path of movement of the lithographic plate for applying gum arabic to the exposed surface thereof.

3,936,854

APPARATUS FOR DEVELOPING PHOTOSENSITIVE MATERIAL

David S. Smith, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1974, Ser. No. 473,034
Int. Cl.² G03D *13/00, 3/08*
U.S. Cl. 354—299 5 Claims



1. In apparatus for the fluid processing of a photosensitive material comprising a support and at least one photosensitive layer bearing a latent image area of a predetermined size and shape, the combination comprising:

a first member having an open-end chamber of a size and shape larger than the latent image area, at least one duct having an entry into the open-end chamber outwardly of an area of the open-end chamber generally equivalent to that of the latent image area for interconnecting the open-end chamber to a first source of air under pressure, at least one inlet and at least one outlet interconnecting the open-end chamber within the area to a second source of air under pressure and to at least one source of processing fluid;

sealing means arranged within the open-end chamber comprising a pair of similar flexible, extending members arranged in spaced and coaxial relation with one another, the outermost member being of a size larger than the latent image area and arranged outwardly of the duct entry for engaging the photosensitive layer when the material is arranged with respect thereto, and the innermost member being of a size for engaging the photosensitive layer immediately adjacent the latent image area and arranged between the duct entry and the inlet and the outlet for confining the processing fluid to the latent image area;

a second member movable relative to the first member for clamping the material therebetween with the latent image area generally aligned with the sealing means;

means interconnected to the second member for moving the latter into a material clamping position relative to the first member; and

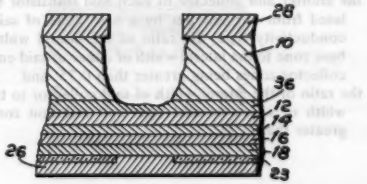
control means associated with the, first and second sources of air and with the source of processing fluids and operable when the first and second members are in the material clamping position, for introducing a flow of the processing fluid and a first flow of air from the second source through the open-end chamber and over the latent image area within the confines of the innermost member, and a second flow of air from the first source between the outermost and innermost members to increase the effective seal of the outermost member with the material and at the same time to disengage the innermost member from the material, whereby the second flow of air removes any accumulation of the processing fluid at the effective seal of the innermost member.

3,936,855

LIGHT-EMITTING DIODE FABRICATION PROCESS

James Emanuel Goell, Roanoke, Va., and Yet-Zen Liu, Fort Wayne, Ind., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 8, 1974, Ser. No. 495,697
Int. Cl.² H01L *33/00*
U.S. Cl. 357—17 11 Claims



1. A gallium arsenide-aluminum gallium arsenide light-emitting diode comprising,

a GaAs substrate layer of a first conductivity type, said GaAs layer being capable of being etched by a given etchant,

a first AlGaAs layer of said first conductivity type on said substrate layer, said first AlGaAs layer having a sufficiently high concentration of aluminum so that said first AlGaAs layer is resistant to etching by said given etchant,

a first AlGaAs layer of a second conductivity type over said first AlGaAs layer of said first type,

a second AlGaAs layer of said second conductivity type on said first AlGaAs layer of said second type, and

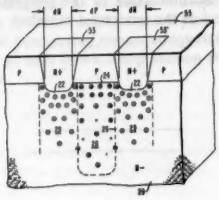
a GaAs layer of said second conductivity type on said second AlGaAs layer of said second type.

3,936,856

SPACE-CHARGE-LIMITED INTEGRATED CIRCUIT STRUCTURE

Steven Magdo, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 28, 1974, Ser. No. 473,650
Int. Cl.[2] H01L 29/74
U.S. Cl. 357—21 10 Claims



1. An integrated circuit structure comprising:
a high resistivity substrate of at least 10,000 ohm-cm semiconductor material of a first conductivity type;
a plurality of impurity zones of said first conductivity type and a second conductivity type extending from one surface of said substrate to the interior thereof to form at least first and second space-charge-limited transistors of a first conductivity type;
an isolation zone of said second conductivity type separating the collectors of said transistors;
the ratio of the lateral width of said isolation zone to the lateral width of either of said collectors being greater than 0.75;
the emitter and collector of each said transistor being isolated from one another by a base zone of said second conductivity type, the ratio of the lateral width of said base zone to the lateral width of either of said emitter and collector zones being greater than 0.75; and
the ratio of the lateral width of said collector to the lateral width of either of said base and isolation zones being greater than 0.25.

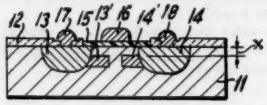
3,936,857

INSULATED GATE FIELD EFFECT TRANSISTOR HAVING HIGH TRANSCONDUCTANCE

Michihiro Ota, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed June 28, 1974, Ser. No. 484,350
Claims priority, application Japan, July 2, 1973, 48-74612
Int. Cl.[2] H01L 29/78
U.S. Cl. 357—23 8 Claims

1. An insulated gate field effect transistor comprising a semiconductor substrate of one conductivity type, source and drain regions of the opposite conductivity type formed in said semiconductor substrate, at least one extended region of said opposite conductivity type electrically connected to and extending from one of said source and drain regions toward the other of said source and drain regions, said at least one extended region being formed within said semiconductor substrate and electrically isolated from the other of said source and drain regions by a gap, a gate insulation film formed on said surface of said semiconductor substrate between said source and drain regions, and a gate electrode formed on said



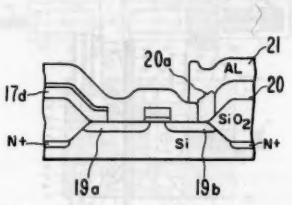
gate insulation film, said gate electrode overlying said gap and overlapping at least a part of said extended region.

3,936,858

MOS TRANSISTOR STRUCTURE

Robert B. Seeds, and Robert L. Luce, both of Los Altos Hills, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 323,672, Jan. 15, 1973, abandoned.
This application Aug. 19, 1974, Ser. No. 498,674
Int. Cl.[2] H01L 29/78, 29/34, 29/06
U.S. Cl. 357—23 6 Claims



1. A metal-oxide-semiconductor structure which comprises:
semiconductor material containing a source region and a drain region formed adjacent a surface of said material;
insulation overlying said surface of said semiconductor material, said insulation comprising a first portion of a first substantially uniform thickness overlying that portion of the surface of said semiconductor material between said source region and said drain region and parts of said source region and said drain region, a second portion of a second substantially uniform thickness overlying the field of said semiconductor material surrounding said source region, said drain region and the region between said source region and said drain region, and a third portion connecting said first portion to said second portion and overlying the peripheries of said source region and said drain region and the region of said field directly adjacent to said source region and said drain region, said third portion of insulation comprising a first section of insulation extending from said first portion toward said second portion and a second section of insulation material extending from said first section of insulation into contact with said second portion, said first section having a thickness which increases gradually from the thickness of said first portion to a peak; the top surface of said first section rising gradually to said peak, said first section ending at said peak, said second section beginning at said peak and having a thickness equal to that of said first section beneath said peak and which remains approximately constant for a selected distance and then gradually increases until at the point where said second section joins said second portion, said second section has a thickness equal to that of said second portion, said second section having a top surface which in the region adjacent said peak has a slope opposite in sign to that of the top surface of said first section, said top surface of said second section forming a trough in the region between said peak and said second portion; a gate elec-

trode formed over said insulation between said source region and said drain region;

insulating material covering the top surfaces of said source region and said drain region, said gate electrode and said insulation; and

contact leads contacting said source region, said drain region, and said gate electrode through openings in said insulating material.

3,936,859

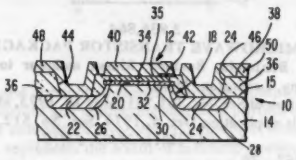
SEMICONDUCTOR DEVICE INCLUDING A CONDUCTOR SURROUNDED BY AN INSULATOR

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 385,669, Aug. 6, 1973, abandoned. This application Apr. 22, 1975, Ser. No. 570,516

Int. Cl.² H01L *29/78, 29/34, 29/06*

U.S. Cl. 357—23 **6 Claims**



1. An insulated gate field effect semiconductor device comprising

a body of silicon having a first surface, a mesa projecting from said first surface, and a second surface on said mesa generally parallel to said first surface,

regions of one type conductivity in said mesa adjacent to respective opposite sides of said mesa, a zone of said mesa between said regions being of conductivity type opposite to that of said regions,

a layer of insulating material on said second surface of said body of silicon,

a layer of conductive material adjacent to said layer of insulating material and having a planar surface substantially parallel to the second surface of said body of silicon, and

a single-layered homogeneous body of insulating material on said first surface of said body of silicon and in contiguous surrounding relation to said mesa, said insulating layer, and said conductive layer, and having a surface spaced from and substantially parallel to said first surface of said body of silicon, said planar surface of said conductive layer being everywhere the same distance from or closer to said first surface of said body of silicon than the surface of said body of insulating material is to said first surface of said body of silicon when these distances are measured in a direction substantially normal to said first surface of said body of silicon.

3,936,860

FABRICATION OF A SEMICONDUCTOR DEVICE

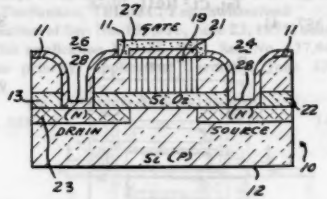
Bryan H. Hill, 305 Glenridge Road, Kettering, Ohio 45429

Division of Ser. No. 423,854, Dec. 11, 1973, Pat. No. 3,873,373, which is a continuation-in-part of Ser. No. 269,359, July 6, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,768

Int. Cl.² H01L *29/78, 29/04*

U.S. Cl. 357—23 **5 Claims**

1. An insulated gate, field effect transistor comprising a semiconductor body of a first conductivity type having a top and a bottom surface; a layer of an oxide of the semiconductor disposed intermediate the top and bottom surfaces of the semiconductor body; a source area and a drain area positioned in the semiconductor body adjacent the lower surface of the oxide layer and separated from one another by a region of the body between the top surface of the body and the upper surface of the oxide layer and a region of the body below the lower surface of the oxide layer, each area having a conductivity type opposite the first conductivity type; and a gate electrode positioned on the top surface of the region of the semiconductor body between the top surface of the body and the upper surface of the oxide layer, the region being in a degenerate state.



3,936,861

CHARGE-COUPLED DEVICE AND METHOD OF FABRICATION OF THE DEVICE

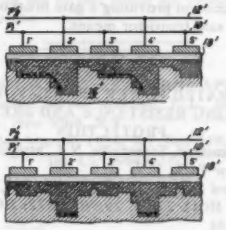
Joseph Borel, Echirolles; Jacques Lacour, Grenoble, and Gerard Merckel, La Tronche, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 217,595, Jan. 13, 1972, abandoned. This application Mar. 12, 1974, Ser. No. 450,433

Claims priority, application France, Jan. 14, 1971, 71.01182. The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.

Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 **2 Claims**



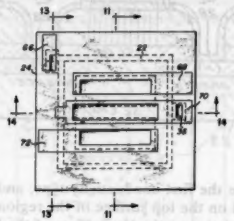
1. A charge-coupled device comprising, a doped semi-conductor substrate coated with an insulating thin film carrying at least one assembly 2*a* of conductive electrodes which are disposed in succession along one axis, said substrate having a doped surface region beneath said assembly, a surface region beneath each electrode more heavily doped beneath the upstream edge of the electrode than beneath the remainder of said electrode whereby a potential barrier for the minority carriers is created upstream, with respect to the direction of transfer of said carriers, of a charge-storage region in approximately coincident relation with the region which is subjacent to one of the electrodes, means for injecting a predetermined charge of minority carrier beneath at least the first electrode, and means for establishing the same value of potential for all the odd-numbered electrodes as well as the same value of potential for all the even-numbered electrodes and for modifying these values in cycles each of which causes the transfer of the carrier from each alternate electrode to one of the adjacent electrodes whose potential barrier is located on the same side as the electrode from which the charge is derived.

3,936,862

MISFET AND METHOD OF MANUFACTURE

Kenneth J. Moyle, Los Altos Hills, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 764,543, Oct. 2, 1968, Pat. No. 3,518,750.
This application Mar. 30, 1970, Ser. No. 29,321
Int. Cl.² H01L 29/78
U.S. Cl. 357—41 8 Claims



1. A metal-insulator-semiconductor field-effect transistor means comprising:

a body of semiconductive material of a first conductivity type having formed therein a pair of spaced apart regions of a second conductivity type respectively forming the source and drain of said transistor means;

a belt-like region of said first conductivity type circumscribing said source and drain regions, said belt-like region having a higher impurity concentration than said body of semiconductive material;

an external region of said second conductivity type disposed outside said belt-like region and contiguous therewith so as to form a P-N junction therebetween; and

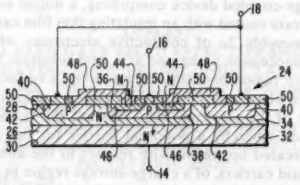
metallic gate electrode means disposed above and electrically insulated from the region separating said source and drain regions and extending across said P-N junction, said gate electrode ohmically contacting said external region, said P-N junction providing a gate breakdown protection means for said transistor means.

3,936,863

INTEGRATED POWER TRANSISTOR WITH BALLASTING RESISTANCE AND BREAKDOWN PROTECTION

John Aaron Olmstead, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,362
Int. Cl.² H01L 27/02, 29/90, 29/72; H03K 3/26
U.S. Cl. 357—51 8 Claims



1. An integrated semiconductor device having resistor ballasting and having reverse bias breakdown protection comprising;

a body of semiconductor material having one type conductivity and having at least a first and a second surface,

at least one first region, having a second type conductivity, adjacent said first surface and forming an equal number of first PN junctions at the interface therebetween,

at least one second region, having said second type conductivity, adjacent said first surface, and forming at least one second PN junction at the interface with said body of semiconductor material and being spaced apart from said first region thereby,

at least one third region, having said one type conductivity, within said first region and separated from said body of semiconductor material thereby, said third region and said first region have a third PN junction at their interface,

a plurality of jumper means, insulatingly disposed over said body of semiconductor material, providing electrical paths from said second region to said third region,

first terminal means providing electrical contact to said body of semiconductor material,

second terminal means providing electrical contact to said first region, and

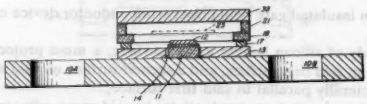
third terminal means providing electrical contact to said second region, said third terminal means being spaced apart from said plurality of jumper means.

3,936,864

MICROWAVE TRANSISTOR PACKAGE

James A. Benjamin, Boxford, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 361,731, May 18, 1973, abandoned.
This application Oct. 4, 1974, Ser. No. 512,829
Int. Cl.² H01L 23/02, 23/12
U.S. Cl. 357—74 10 Claims



1. A semiconductor device comprising in combination:

a thermally and electrically conducting base member;

an electrically conducting planar member coupled to said base member, said planar member having an aperture therein;

a thermally conducting, electrically insulating support for a semiconductor body, said support having upper and lower surfaces, said support being positioned in said aperture of said planar member, said lower surface being coupled to said base member, and said upper surface having a conductive coating thereon; and

at least one lead for electrically coupling said conductive coating to said base member through said planar member, one end of said lead being coupled to said conductive coating and the other end of said lead being coupled to the surface of said planar member.

3,936,865

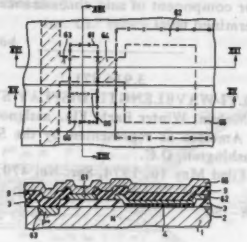
SEMICONDUCTOR DEVICES HAVING CONDUCTOR TRACKS AT DIFFERENT LEVELS AND INTERCONNECTIONS THEREBETWEEN

David Phythian Robinson, Vigo, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 446,103
Claims priority, application United Kingdom, Feb. 28, 1973, 9713/73
Int. Cl.² H01L 29/40, 23/48, 29/46
U.S. Cl. 357—68 9 Claims

1. A semiconductor device comprising a semiconductor body comprising a first surface, a first insulating layer on said first surface of the semiconductor body, a first conductive connection layer comprising a strip portion and disposed on said first insulating layer, a second insulating layer overlying said first insulating layer and first conductive connection layer, and a second conductive connection layer situated on

said second insulating layer, said second insulating layer comprising an aperture that at least partly overlies said strip portion of said first conductive connection layer and has a cross-dimension d in a direction substantially at right angles to the longitudinal direction of said strip portion, a contact portion



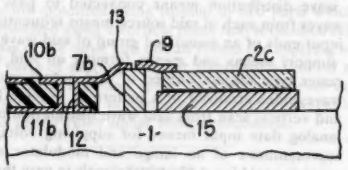
of said second conductive connection layer completely covering said aperture and contacting said strip portion of said first conductive connection layer via said aperture, wherein $x < d + 2t$ and x represents the width of said strip portion and t the alignment tolerance associated with the definition of said aperture with respect to said strip portion.

3,936,866

HEAT CONDUCTIVE MOUNTING AND CONNECTION OF SEMICONDUCTOR CHIPS IN MICRO-CIRCUITRY ON A SUBSTRATE

Norman J. Grossman, Malibu, and Jacques F. Linder, Palos Verdes Peninsula, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed June 14, 1974, Ser. No. 479,410
Int. Cl.² H01L 39/02
U.S. Cl. 357—80 **4 Claims**



1. A heat conductive mounting for an integrated circuit chip in an electronic assembly, comprising:

a. an electrical insulating and heat conducting substrate having a top surface with electrical circuitry thereon for connection to leads from an integrated circuit chip;

b. an integrated circuit chip having one face with terminal pads thereon, said chip positioned terminal-face up above said top surface of said substrate, beam leads having two ends each, one of said ends connected respectively to said terminal pads, and the other ends of said beam leads extending outwardly beyond said chip;

c. a solid pedestal of heat conductive metal electroformed directly onto said substrate top surface and bonded continuously to the lower face of said integrated circuit chip opposite said terminal face thereof; and

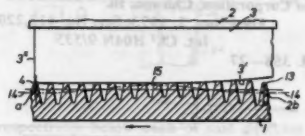
d. means electrically bonding said other ends of said beam leads respectively to predetermined portions of said electrical circuitry.

3,936,867

RECORD CARRIER, METHOD OF PRODUCING THE RECORD CARRIER AND METHOD FOR REPRODUCING STORED SIGNAL THEREFROM

Hans-Joachim Thuy, and Gerhard Dickopp, both of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC, Zug, Switzerland

Continuation of Ser. No. 155,910, June 23, 1971, abandoned. This application Jan. 28, 1974, Ser. No. 437,047
Claims priority, application Germany, June 23, 1970, 2032269
Int. Cl.² H04N 9/00; G11B 3/00, 3/70
U.S. Cl. 358—4 **14 Claims**



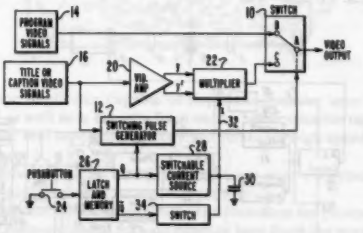
1. A method of producing a record carrier having signals mechanically stored thereon for use with a pickup means which is maintained substantially immovable in the direction of a force acting to maintain the pickup means in engagement with the record carrier, comprising the steps of: applying to a flexible, compressible record carrier hill and dale undulations constituting a spatial representation of a broadband signal in the form of a frequency modulated carrier oscillation and at least one further signal of lower frequency than the frequency of the broadband carrier oscillation; and imparting an amplitude to the lower frequency signal such that when the stored signals are played back by the pickup means, which operates by compression of the hills of the hill and dale undulations, even the broadband signal hills which coincide with dales of the further signal contact the pickup means and are compressed thereby, while the broadband signal hills which coincide with hills of the further signal are compressed less than completely thereby.

3,936,868

TELEVISION STUDIO CONTROL APPARATUS

Laurence Joseph Thorpe, Marlton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,451
Int. Cl.² H04N 5/22
U.S. Cl. 358—22 **5 Claims**



1. Television studio control apparatus, comprising:

a mixer having a pair of input terminals, a control terminal and an output terminal;

means applying first video signals to one of said pair of input terminals;

means applying second video signals to the other of said pair of input terminals;

means applying switching signals to said control terminal substantially in time synchronism with the application of

said second video signals to said mixer for coupling said second video signals to said output terminal in the presence of said switching signal and for coupling said first video signals to said output terminal in the absence of said switching signals;

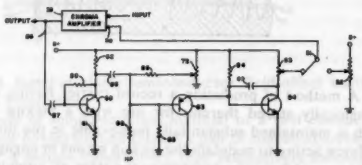
said second video signal applying means applying its signals to said other of said pair of input terminals at an amplitude level which varies linearly with time.

3,936,869

AUTOMATIC COLOR LEVEL CIRCUIT WITH PEAK DETECTOR

Howard F. Jirka, Mount Prospect, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 2, 1973, Ser. No. 412,220
Int. Cl.² H04N 9/535
U.S. Cl. 358—27 7 Claims



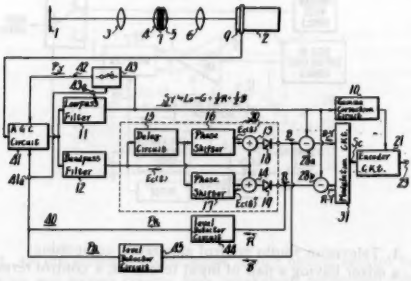
1. In combination: a source of signals subject to a substantial range of amplitude variation; means for amplifying said signals; sample-and-hold control means, including peak detector means, detecting portions of said signals having amplitudes exceeding a predetermined threshold level and supplying a control potential to said amplifying means for producing a compensating gain adjustment, said control means including a transistor normally operated near saturation but being subject to cutoff, said transistor presenting a relatively long time constant during conduction and a short time constant during cutoff.

3,936,870

AUTOMATIC GAIN CONTROL FOR COLOR TELEVISION CAMERA WITH REPRODUCED COLOR FIDELITY

Takashi Nakamura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 28, 1974, Ser. No. 474,054
Claims priority, application Japan, May 29, 1973, 48-60066
Int. Cl.² H04N 9/04
U.S. Cl. 358—27 7 Claims



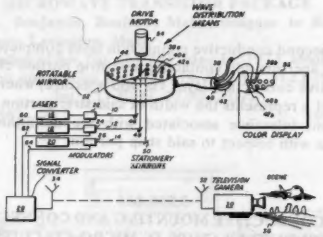
1. Color television camera apparatus, comprising an image pickup tube; color filter means for forming color separated images of a viewed object on said image pickup tube; means for deriving a composite color video signal from said image pickup tube representative of said color separated images, said composite signal including a luminance signal and a chrominance signal, the latter being comprised of plural color components; means for separating said composite color video signal into said luminance and chrominance signals, respectively; level control means for controlling the magnitude of said composite color video signal in response to said luminance signal when none of said color components of said chrominance signal exceeds a predetermined level; and means for controlling said level control means with a different signal when a color component of said chrominance signal exceeds said predetermined level.

3,936,871

MULTI-WAVELENGTH DISPLAY SYSTEM

Windell N. Mohon, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1974, Ser. No. 470,415
Int. Cl.² H04N 9/12, 1/02
U.S. Cl. 358—56 6 Claims



1. A multi-wavelength display system comprising

a. a plurality of electro-magnetic radiation source means, each of different wavelength and all within the frequency range of 10^9 to 10^{17} cycles per second;

b. an arrangement of groups of waveguides having input and output ends, one group for each radiation source;

c. wave distribution means connected to pass radiation waves from each of said source means sequentially to the input ends of an associated group of said waveguides;

d. support means and means forming on said support a raster type display formed of said output ends of said waveguides arranged in a pattern to provide horizontal and vertical scan from said wave distribution means;

e. analog data input means for supplying voltage signals representative of an image and modulator means for receiving said input electrical signals to vary the intensity of radiation beam from each radiation source to reproduce on said display said image in radiation source wavelengths;

said wave distribution means including

f. means holding said input ends of each group of waveguides in sequential circular arrangement inwardly directed toward a common axial center, each group in a plane parallel to its adjacent group;

g. reflector means including stationary reflectors and a rotatable reflector;

h. said stationary reflectors being positioned each to pass waves from as associated radiation source to said rotatable reflector and said rotatable reflector being positioned, with respect to said wavelength input ends, centrally and concentric therewith to redirect radiation rays from each of said radiation source to an associated group of said input ends of said waveguide groups in sequential manner as said rotatable reflector is rotated; and

i. means for rotating said rotatable reflector at a speed selected to provide a desired raster scan rate.

3,936,872
VIDEO SIGNAL REPRODUCING DEVICE WITH ELECTRON BEAM SCANNING VELOCITY MODULATION

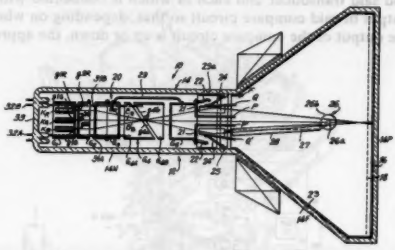
Senri Miyaoka, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 17, 1974, Ser. No. 515,665

Claims priority, application Japan, Dec. 21, 1973, 48-3433; June 4, 1974, 49-64815

Int. Cl.² H04N 9/16

U.S. Cl. 358—64 **17 Claims**



1. In a video signal reproducing device comprising a cathode ray tube having a phosphor screen; an electron gun in said tube including beam producing means directing at least one electron beam along the axis of said tube toward said screen for impingement on the latter, and main electron lens means disposed between said beam producing means and said screen for focusing each said beam at said screen, said main electron lens means having at least two tubular electrodes arranged coaxially in succession along said axis of the tube for the passage of each said beam through said electrodes with a relatively low potential being applied to one of said electrodes and a relatively high potential being applied to the other of said electrodes for producing an electrical field which effects said focusing of each said beam; and deflection yoke means on said tube between said main electron lens means and said screen for causing each said beam to scan said screen in line-scanning and vertical directions, respectively; the improvement of said one tubular electrode which is maintained at said relatively low potential being formed in two parts which are axially separated along a vertical plane that is inclined relative to said axis of the tube, and circuit means for applying across said two parts of said one tubular electrode a control signal which varies the scanning speed of each said beam in said line-scanning direction in response to transient changes in the brightness of the video signal being reproduced.

3,936,873
CONVEYOR BELT SYSTEM

Stig Allan Junior Alfredsson, Sandviken, Sweden, assignor to Sandvik Aktiebolag by change of name from Sandvikens, Jernverks Aktiebolag, Sandviken, Sweden

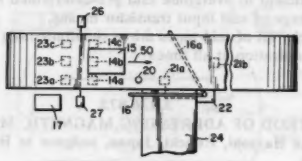
Division of Ser. No. 876,967, Nov. 14, 1969, Pat. No. 3,666,080. This application May 26, 1972, Ser. No. 257,451

Claims priority, application Sweden, Apr. 28, 1969, 5929/69. The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.

Int. Cl.² G11B 5/00

U.S. Cl. 360—1 **8 Claims**

1. In control means for a steel belt conveyor wherein the steel belt is of sheet steel and has top and bottom surfaces and extends along a conveyor run which carries load units to a plurality of discharge stations, the combination of, magnetizing means to produce magnetized signal portions in said belt in the form of magnetized spots, each of said magnetized signal portions comprising the entire portion of the belt between two opposite coextensive discrete areas of the belt surfaces at a predetermined distance from one edge of the belt, said magnetizing means being operative to substantially saturate each of said signal portions between its discrete surface areas with flux perpendicular to said belt surfaces and to thereby produce a magnetic pole of single-polarity throughout said signal portion, a plurality of detector means each of which is positioned adjacent said bottom surface of the belt at a zone along the belt path relative to the position of a selected discharge station, a plurality of cores of magnetizable material



positioned respectively below each of said detector means opposite said bottom surface and extending therefrom away from said bottom surface whereby said core aids in concentrating magnetic flux paths through said detector means, control means responsive to the detection of a magnetized signal portion by each of said detector means, and means to discharge load units from said belt at each of said selected discharge stations in response to such detection by its detector means and under the control of said control means.

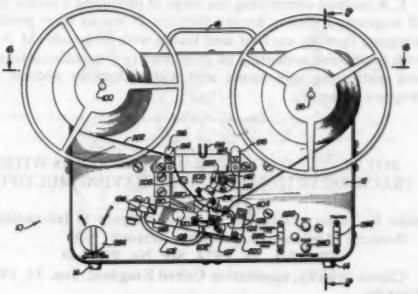
3,936,874
MULTI-FORMAT TAPE DUPLICATOR

Norman G. Dusanek, Tarzana, Calif., assignor to Glen Miller, Panorama City, Calif.

Filed Oct. 11, 1973, Ser. No. 405,672

Int. Cl.² G11B 5/86

U.S. Cl. 360—15 **2 Claims**



1. A tape duplicator capable of duplicating master tape in reel form as well as in cassette form onto a blank cassette tape and a blank reel tape simultaneously at relatively high speeds, comprising:

single drive means for advancing said tapes over a playback head and recording heads, respectively;

single capstan means having different diameters for producing a different speed for said cassette tape from the speed for said reel tape;

audio amplifier means connected between said playback head and said recording heads, said audio amplifier means having an automatic volume control circuit comprising:

input transistor means having a pre-determined base-emitter voltage;

circuit means for providing a pre-determined volume level on said blank tapes for duplicating a master tape whose recorded volume level is below said pre-determined vol-

ume level and for duplicating a master tape whose recorded volume level is above said pre-determined volume level; and

circuit means including a field effect transistor for maintaining constant amplifier gain while the signal input to said automatic volume control circuit remains insufficient to overcome said pre-determined base-emitter voltage of said input transistor means, thereby preventing a change in the amplifier gain until after receipt of a signal input sufficient to overcome said pre-determined base-emitter voltage of said input transistor means,

whereby all of said tapes move simultaneously and in synchronization at all times.

3,936,875

METHOD OF ADDRESSING MAGNETIC MEMORY

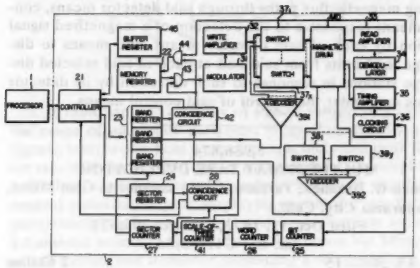
Yukitaka Hayashi, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 2, 1973, Ser. No. 329,093

Claims priority, application Japan, Feb. 4, 1972, 47-12218

Int. Cl.² G11B 5/09

U.S. Cl. 360—48 **15 Claims**



1. A method comprising the steps of providing a sector type of magnetic memory having thereon 2^q tracks (q = positive integer), forming each of said tracks with M bands ($M > 2$) with each band consisting of 2^p sectors (p = positive integer), and addressing said bands and said sectors to address the magnetic memory.

3,936,876

ROTATABLE DATA STORAGE APPARATUS WITH TRACK SELECTION ACTUATOR HAVING MULTIPLE VELOCITIES

John R. Taylor, Eastleigh, England, assignor to International Business Machines Corporation, Armonk, N.Y.

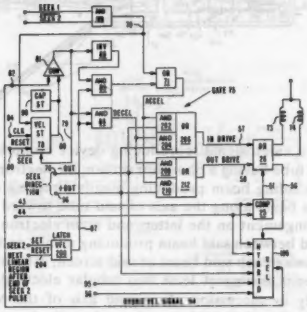
Filed Jan. 21, 1974, Ser. No. 435,140

Claims priority, application United Kingdom, Jan. 31, 1973, 4865/73

Int. Cl.² G11B 21/08, 5/55

U.S. Cl. 360—78 **7 Claims**

1. Data storage apparatus comprising a rotatable storage medium having a number of data tracks thereon, a data transducer moveable over the data tracks, an actuator for so moving the data transducer, means supplying signals to said actuator to cause the actuator to accelerate said transducer over a first predetermined distance, means supplying control signals to said actuator to move said transducer at a substantially uniform velocity over a second predetermined distance with the uniform velocity being equal or substantially equal to the velocity attained by said transducer as a result of the acceleration, means for retarding said transducer over the remaining distance until said transducer is over its destination track on said rotatable storage medium, means for determining the instantaneous velocity value of said data transducer as it moves, and means for storing a value representative of the velocity attained by said transducer as a result of the acceleration, said means supplying control signals to said actuator to move said transducer at a substantially uniform velocity including a compare circuit for comparing the instantaneous velocity value of said data transducer with said stored value and means connecting said compare circuit with said actuator so as to slow and hasten the movement of the actuator with different outputs of said compare circuit depending on the velocity corresponding to said stored value and the instantaneous velocity of the actuator, said means for supplying control signals to move said transducer at a substantially uniform velocity including a too slow logic gate and a too fast logic gate which respectively accelerate and retard said actuator and said transducer and each of which is connected with the output of said compare circuit so that, depending on whether the output of the compare circuit is up or down, the appropriate logic gate is energized to control the speed of the actuator and transducer and maintain the speed at said substantially uniform velocity.



5. Data storage apparatus comprising a rotatable storage medium having a number of data tracks thereon, a data transducer moveable over the data tracks, an actuator for moving the data transducer, means for determining the instantaneous velocity value of said data transducer as it moves, means for storing a value representative of a desired velocity of said transducer, means for controlling the velocity of said transducer including a compare circuit for comparing the instantaneous velocity value of said data transducer with said stored value, and means connecting said compare circuit with said actuator so as to slow and hasten the movement of the transducer with different outputs of the compare circuit depending on the velocity corresponding to said stored value and the instantaneous velocity value of the transducer and including a too slow logic gate and a too fast logic gate which respectively accelerate and retard said actuator and said transducer and each of which is connected with the output of said compare circuit so that depending on whether the output of the compare circuit is up or down the appropriate logic gate is energized to control the speed of the actuator and transducer, said actuator for moving the data transducer including a coil carrying a current in order to provide movement of the data transducer, said means for determining the instantaneous velocity value of said data transducer including means for providing a position error signal which is proportional to the position of said transducer as said transducer crosses said tracks and means which is subject to said position error signal and is subject to the current through said coil for producing said instantaneous velocity value depending upon both said position error signal and the current flowing in said coil.

3,936,877

TAPE TRANSPORT APPARATUS FOR CASSETTE TYPE TAPE RECORDER

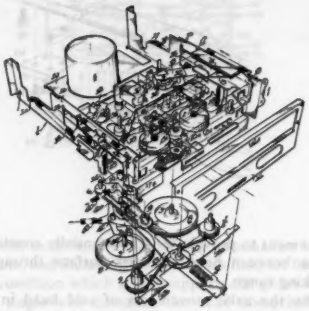
Yoshio Maruyama; Yoshihiro Magata; Akihiro Fushimi; Yoshiharu Ueki, and Katsuhisa Shimizu, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 11, 1974, Ser. No. 450,265

Claims priority, application Japan, Mar. 9, 1973, 48-29552[U]

Int. Cl.[2] G11B *23/04, 15/43, 15/28*

U.S. Cl. 360—96 **2 Claims**



1. A tape transport apparatus for cassette type tape recorder comprising:

a. a lift deck means engaging a tape cassette, which is movable between a first position wherein the cassette is retained in a stationary position, and a second position which allows insertion or removal of the cassette from the tape recorder;

b. means to move said lift deck means in a first direction from said first position to an intermediate position and in a second direction perpendicular to said first direction from said intermediate position to said second position;

c. an electric motor for rotating a capstan and at least one reel driving spindle in the forward or backward direction;

d. a carriage means supporting a magnetic transducer head means, said carriage movable between a first position wherein the transducer head is in contact with the tape in a cassette and a second position displaced from said first position by a predetermined distance;

e. a pinch roller adapted to engage said capstan when said carriage means is in said first position;

f. means to control said electric motor so as to rotate the supply reel in the backward or rewind direction when the lift deck means is placed in the first position;

g. means for detecting the rotation of a take-up reel driving spindle in the backward direction so as to switch the rotating direction of said electric motor, and

h. means for detecting the starting of rotation of said capstan in the forward direction to shift said carriage means from said second position to said first position.

3,936,878

DISC INTERFACE LOCATION

Walter R. Chrysler, Pleasant Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,601

Int. Cl.[2] G11B *17/22, 5/016, 25/04*

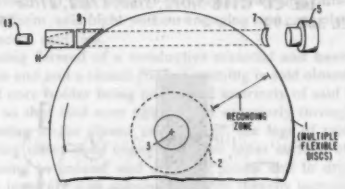
U.S. Cl. 360—98 **9 Claims**

1. In a rotating disc storage file comprising multiple spaced flexible discs and access position sensing apparatus movable relative to edges of said discs for detecting spaces between said discs and for providing signals which can be used to accurately count said spaces, improved sensing apparatus comprising:

a source of light for illuminating said spaces;

a pair of photocells; and

a pair of offset fiber optic shaping arrays movably positioned between said discs and said photocells for conveying light from said spaces to respective said photocells in



a form congruent to the shape of said photocells; said arrays having line-shaped light receiving ends arranged in parallel lines offset from each other in the direction of the axis of rotation of the discs by an offset spacing distance less than the width of a disc space.

3,936,879

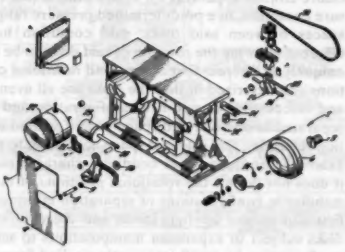
CARTRIDGE TYPE PLAINT DISC APPARATUS

Kenneth Allan Gustafson, Villa Park, Calif., assignor to Century Data Systems, Inc., Anaheim, Calif.

Filed Mar. 16, 1973, Ser. No. 342,167

Int. Cl.[2] G11B *15/16, 21/08*

U.S. Cl. 360—99 **1 Claim**



1. In a pliant disk recording system of the type utilizing a rigid cartridge for retaining the disk, the improvement which comprises:

a stepping motor having helically cut armature extension;

a carriage adapted to translate in accordance with the rotation of said helically cut armature;

a read/write straddle erase head attached to siad carriage adjacent to the recording surface of said pliant disk;

means for actuating said stepping motor in accordance with external commands whereby said head may be incrementally moved from one track positon to another;

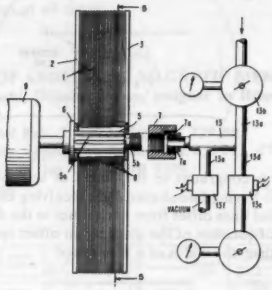
means for detecting the limit positions of carriage travel, said means comprising:

a tower having a photelectric sensor, said tower to be positioned adjacent to location at the end of carriage travel whereby the presence of the carriage will interrupt light impinging on said photoelectric sensor.

3,936,880
BISTABLE DEFLECTION SEPARATION OF FLEXIBLE DISKS

Bernard W. McGinnis, Poughkeepsie; Anthony W. Orlando, Highland, and James A. Weidenhammer, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,830
Int. Cl.² G11B *5/012, 5/60, 17/22, 21/08*
U.S. Cl. 360—99 **45 Claims**



1. In a data storage device including multiple centrally restrained flexible storage disks arranged in a stack for continuous rotation about a common axis, with fluid-permeable open spaces between recording surfaces of successive disks and with the disks bendable between their centers and peripheries while rotating to effect stable expansion and contraction of any selected space between recording surfaces of successive said disks suitable for providing random selective external transducing access to surfaces adjacent the selected space, the improvement comprising:

pressure control apparatus for establishing a first fluid pressure condition, in a predetermined pressure range, in said spaces between said disks; said condition having the effect of allowing the rotation of said disks to be stabilized uniquely in discrete first and second rotational configurations characterized in that the disks are all evenly spaced and inaccessible in said first configuration and unevenly separated at one selected space in said second configuration rendering said selected space accessible to receive an external transducer; said condition characterized in that it does not permit the rotational positions of the disks to stabilize in configurations of separation intermediate said first and second configurations and thereby renders the disks subject to expansion manipulations to said second configuration by small transiently applied forces.

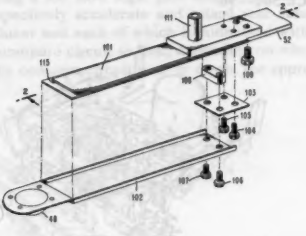
3,936,881
AIR DAMPED HEAD SUSPENSION

Anthony W. Orlando, Highland, and James A. Weidenhammer, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,828
Int. Cl.² G11B *5/60, 17/32, 21/20*
U.S. Cl. 360—103 **7 Claims**

1. In a flexible disk magnetic recording device wherein a stack of flexible disks are mounted for rotation on a spindle, said device including means for placing a transducing head into proper compliant transducing relationship with any selected track on any selected disk surface, an improved head suspension assembly for use with a source of gas under elevated pressure relative to the external environment of said assembly, including:

damping means for preventing oscillation of the transducing head over all frequencies of oscillation induced in said head from following variations in the plane of disk rotation, wherein said damping means includes a gaseous filled chamber means receiving gas under elevated pressure from said source, and an escape path means connected to said chamber means for providing a constant gas flow resistance to the escape of gas from said chamber means over a transducing working range of axial head



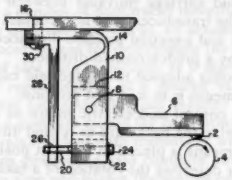
movement to provide for a substantially constant mating force between head and disk surface throughout said working range,

whereby the axial movements of said head in following variations in the plane of disk rotation are damped in a manner not dependent upon the amplitude or frequency of said variations.

3,936,882
ADJUSTABLE MOUNTING ARRANGEMENT FOR RECORDING HEAD

Charles E. Lane, III, Meadowbrook, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 27, 1974, Ser. No. 500,870
Int. Cl.² G11B *5/56, 5/48*
U.S. Cl. 360—104 **5 Claims**



1. A mounting device for a transducer head comprising:

a lever having means for mounting a transducer head at one end thereof and a transverse hole for passing a pivot pin therethrough at the other end thereof,

a support block having a bow-tie shaped slot passing therethrough with the narrowed portion of the slot having confronting faces spaced apart a distance sufficient to allow the end of said lever having said transverse hole to pass therebetween, said lever having a predetermined portion of the end containing said transverse hole located between said confronting faces,

a pivot pin hole passing through said support block in alignment with said confronting faces, and

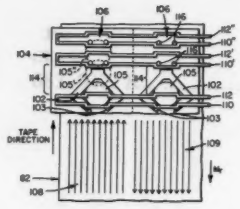
a pivot pin located in said pivot pin hole in said support block and extending across said narrowed portion of said bow-tie shaped slot and through said transverse hole in said lever

3,936,883

MAGNETIC BUBBLE READ/WRITE HEAD

Clarence Herbert Heckler, Jr., Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Dec. 27, 1974, Ser. No. 527,691
Int. Cl.[2] G11B 5/12; B11C 11/14; G11C 19/00
U.S. Cl. 360—110 32 Claims



1. A bubble write head for recording information in a magnetic medium, and including a normal bias field for biasing the head to a condition which stably supports the generation and storage of single wall domains, the head comprising; write bubble platelet means disposed in recording position relative to the recording medium for selectively generating single wall magnetic domains commensurate with the information being recorded, which domains generate stray fields which are insufficient to cause interaction with the magnetic medium;

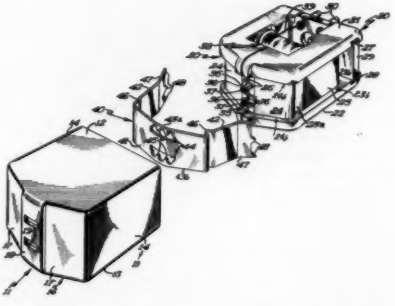
said bubble platelet means including integral bubble expander means for expanding the existing insufficient domains to a size sufficient to apply a write magnetic field to the medium only upon expansion of the domains, thereby to perform the write process.

3,936,884

MAGNETIC TAPE HEAD WITH CLAMPED CORE HOLDERS

John W. Hogan, Golden Valley, Minn., assignor to MagTech Industries, Inc., Minneapolis, Minn.

Filed July 3, 1974, Ser. No. 485,541
Int. Cl.[2] G11B 5/10, 5/28
U.S. Cl. 360—125 8 Claims



1. A magnetic tape head comprised of

a magnetic core including a pair of magnetic core elements, each core element having a tip,

a pair of similar core holder members formed of nonconductive material and each member engaging and supporting said magnetic core elements,

a generally U-shaped resilient clip formed of a conductive material and engaging and clamping said core holders in abutting engagement, and urging the tips of said core elements towards each other to form an electromagnetic circuit, said clip including a bight portion and a pair of symmetrical legs integral therewith diverging outwardly therefrom, said bight portion engaging said core elements adjacent said tips,

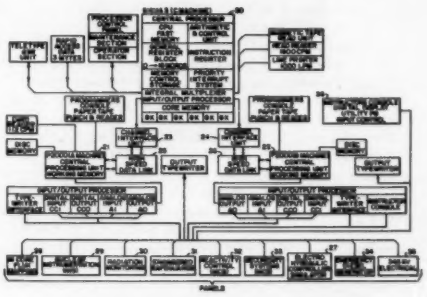
a housing formed of a conductive material and having an open end and a closed end, an opening in said closed end, said core holder being positioned interiorly of said housing so that said core tips project exteriorly through the opening in the closed end thereof, the legs of said clip having outer ends engaged by the inner surface of said housing to ground said magnetic cores and to urge the legs inwardly with scissors action to thereby increase the clamping action on the core holders and to further urge the tips of the magnetic core towards each other.

3,936,885

TRAINING SIMULATOR AND METHOD FOR NUCLEAR POWER PLANT HEATER AND NON-LINEAR MODELING

Boris A. Mutafelija, Allison Park, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1973, Ser. No. 335,183
Int. Cl. G06f 15/06, 15/56; G09b 9/00
U.S. Cl. 444—1 20 Claims



1. An automated training simulator for the real-time dynamic operation of a steam generating plant that includes a plurality of interconnected heat exchangers for increasing the temperature of a fluid by using steam from a predetermined source; said simulator comprising

a plurality of manually operable command devices each corresponding to a distinct plant control device;

calculating means including sequence controlling means having the following components; (a) means governed by the manually operable devices to generate a single data value relating to physical values for the representative plurality of interconnected heat exchangers,

b. means governed by the single generated data value to generate an output data value relating to each of the representative plurality of heat exchangers; and

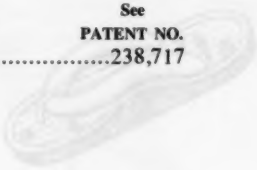
indicating means responsive to the output data values to monitor the operation of the representative plurality of heat exchangers.

DESIGN PATENTS

GRANTED FEBRUARY 3, 1976

ERRATA

For CLASS	See PATENT NO.
083–012. R	238,717

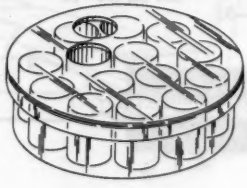


DESIGNS

FEBRUARY 3, 1976

238,623
FOUNDATION GARMENT
Jack J. Lo Cascio, Bayonne, N.J., assignor to Rapid-American Corporation, New York, N.Y.
Filed May 2, 1974, Ser. No. 466,332
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—3

238,624
BOBBIN CASE
Margaret A. McArthur, 4289 Lake Road, Youngstown, Ohio 44514
Filed Mar. 29, 1974, Ser. No. 456,214
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—19 B



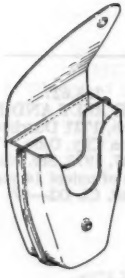
238,625
THONG SANDAL
Harold D. York, Jr., 3952 Bluff St., Torrance, Calif. 90505
Filed Nov. 14, 1974, Ser. No. 523,583
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

238,626
SPORT SHOE
Jonas Senter, Greenwich, Conn., assignor to CITC Industries Inc., New York, N.Y.
Filed Sept. 11, 1974, Ser. No. 505,201
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

238,627
COMBINED BELT AND POCKET
Ruth G. Lewis, 1721 Dorchester Drive, Oklahoma City, Okla. 73120
Filed Dec. 27, 1973, Ser. No. 428,704
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381

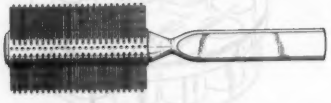
238,628
TENNIS BALL HOLDER ATTACHABLE TO A GARMENT
Walter L. Davis, 3158 E. Southcross, San Antonio, Tex. 78223
Filed Feb. 26, 1974, Ser. No. 445,974
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400

238,629
DOUBLE HANDCUFF CASE
Paul E. Tibbetts, Chula Vista, Calif. (2920 Ares Way, San Diego, Calif. 92139)
Filed Aug. 2, 1974, Ser. No. 494,199
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



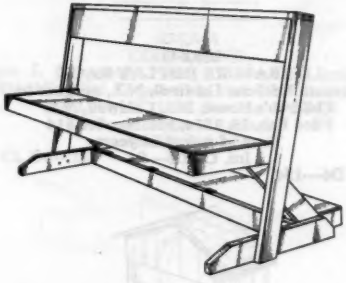
238,630
ZIPPER PULLER
Robert Grant Ammons, Sr., 1533 Northwick Road, Baltimore, Md. 21218
Filed Sept. 11, 1974, Ser. No. 505,094
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415

238,631
HAIR BRUSH
Harold Leighton, Apt. 15, St. John's Wood Court, St. John's Wood Road, London N.W. 8, England
Filed Aug. 3, 1973, Ser. No. 385,253
Claims priority, application Great Britain Feb. 8, 1973
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31

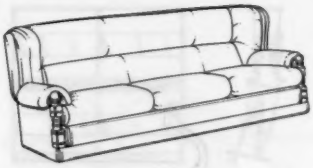


238,632
DISPLAY STAND
Gary Wilding, Chicago, Ill., assignor to Richton International Corporation, New York, N.Y.
Filed May 13, 1974, Ser. No. 469,334
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—23

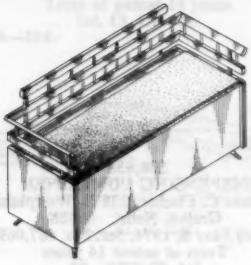
238,633
PEW
Frederick Clive Hunter, "St. Claire," Twyford Gardens, Twyford, Banbury, England
Filed Jan. 31, 1974, Ser. No. 438,454
Claims priority, application Great Britain Aug. 6, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



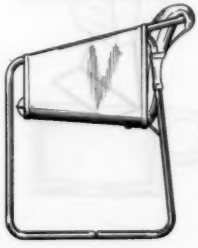
238,634
SEAT
Thomas Winrow, Naperville, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed July 23, 1973, Ser. No. 382,088
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



238,635
COMBINED BENCH AND STORAGE CHEST
James F. Curtin, 16044 E. Queenside Drive, Covina, Calif. 91722
Filed Oct. 2, 1974, Ser. No. 511,168
Term of patent 14 years
Int. Cl. D6—*01, 04*
U.S. Cl. D6—64



238,636
CHAIR
Ogden R. Olson and Roy E. Knoedler, Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.
Filed July 29, 1974, Ser. No. 492,505
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

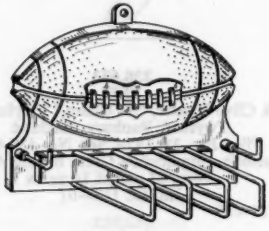


238,637
GRAB BAR
Hans Arne Valentin Johansson, Eslov, Sweden, assignor to John Richard Johansson, Eslov, Sweden
Filed May 16, 1974, Ser. No. 470,456
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—86

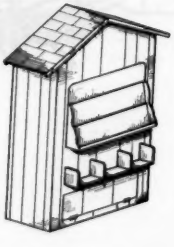
238,638
DISPENSING CONTAINER
Thomas C. Fischer, 238 E. Westplains, Gretna, Nebr. 68028
Filed May 6, 1974, Ser. No. 467,069
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95

238,639
COMBINED MIRROR AND SHELF
John W. Johnson, 626 E. Gutierrez St., Santa Barbara, Calif. 93101
Filed Dec. 9, 1974, Ser. No. 530,764
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—132

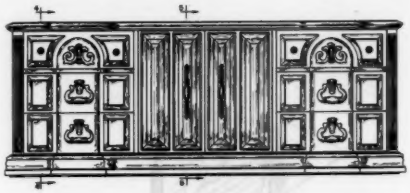
238,640
WALL MOUNTABLE RACK
Jeffrey Snyder, 5225 Collins Ave., Miami Beach, Fla. 33140
Filed July 3, 1973, Ser. No. 376,150
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—114



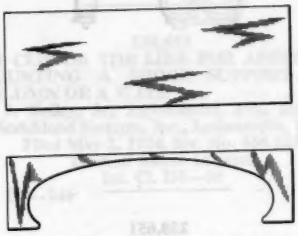
238,641
LITERATURE DISPLAY RACK
Kenneth Edelson, Caldwell, N.J., assignor to Children's House, Inc., Caldwell, N.J.
Filed Feb. 28, 1974, Ser. No. 446,614
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



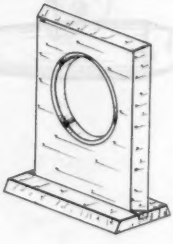
238,642
CABINET OR THE LIKE
Huey T. Keller, High Point, N.C., assignor to Hooker Furniture Corporation
Filed Apr. 17, 1972, Ser. No. 245,028
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



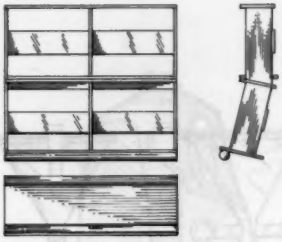
238,643
TABLE
Elliot J. Binzen, 45 W. 11th St., New York, N.Y. 10011
Filed Nov. 27, 1972, Ser. No. 309,951
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



238,644
COIN STAND
Jerome J. Pasquarella, West Chester, Pa., assignor to Franklin Mint Corporation, Franklin Center, Pa.
Filed July 27, 1972, Ser. No. 275,643
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181

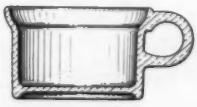


238,645
RACK
William M. Becker, 5915 Onondaga Road, Bethesda, Md. 20016
Filed Sept. 27, 1974, Ser. No. 509,933
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184

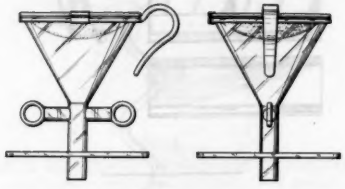


238,646
FURNITURE BASE
Svante Schoblom, Pipplarp, S–573 00 Tranas, Sweden
Filed July 16, 1974, Ser. No. 488,977
Claims priority, application Sweden Jan. 21, 1974
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

238,647
CUP
Gerald Gulotta, New City, N.Y., assignor to Block China Corporation, New York, N.Y.
Filed Dec. 20, 1973, Ser. No. 426,896
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9

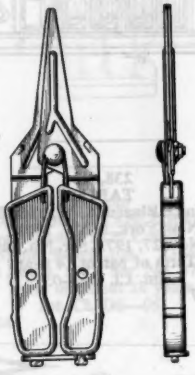


238,648
COMBINED STRAINER AND FAT SEPARATOR FUNNEL
Elizabeth S. Jablecki, 1422 Damon Court SE., Rochester, Minn. 55901
Filed Apr. 29, 1975, Ser. No. 572,744
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—68

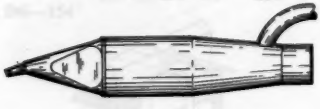


238,649
COMBINED TOWEL DISPENSER AND TRASH RECEPTACLE
William F. Martin, 350 Stonycroft Road, Ridgewood, N.J. 07450
Filed Sept. 20, 1974, Ser. No. 507,736
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—191

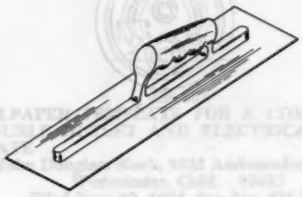
238,650
CUTTING IMPLEMENT
Jeffrey M. Koblick, New Brighton, Minn., assignor to K-Tel International, Inc.
Filed Nov. 29, 1974, Ser. No. 528,042
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—5



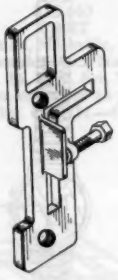
238,651
AIR BLOWING-VACUUMING DESOLDERING APPLIANCE OR THE LIKE
William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402
Filed Nov. 27, 1974, Ser. No. 527,645
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



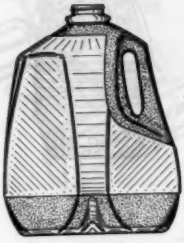
238,652
CONCRETE FINISHING TOOL
William S. Haivala and Paul E. Griggs, Wichita, Kans., assignors to Haivala Concrete Tools, Inc., Wichita, Kans.
Filed Jan. 13, 1975, Ser. No. 540,641
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—45



238,653
SHIM CLIP OR THE LIKE FOR ADJUSTABLY MOUNTING A SHORE SUPPORT ON A COLUMN OR A WALL
Dole J. Kelley, Jr., Jacksonville, Fla., assignor to Strickland Systems, Inc., Jacksonville, Fla.
Filed May 2, 1974, Ser. No. 466,215
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—246

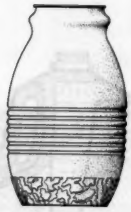


238,654
JUG
Richard L. Platte, Ann Arbor, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed Nov. 11, 1974, Ser. No. 522,336
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

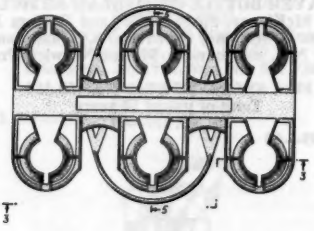


238,655
SPRAYER BOTTLE OR SIMILAR ARTICLE
James C. McKinney, Simpsonville, and William J. Britt and John G. Antonio, Greenville, S.C., and Sam Han, Leonia, N.J., assignors to Morton-Norwich Products, Inc.
Filed Apr. 24, 1974, Ser. No. 463,464
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63

238,656
BEVERAGE CONTAINER OR THE LIKE
Leslie Stephan Marco, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Apr. 29, 1974, Ser. No. 465,021
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100

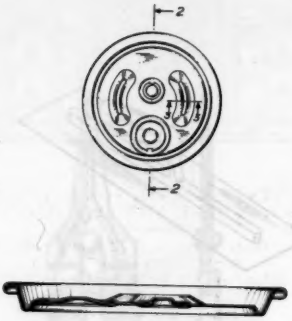


238,657
BOTTLE CARRIER
Gerald Erickson, P.O. Box 6175, Surfside, Fla. 33154
Filed May 22, 1974, Ser. No. 472,087
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—178



238,658
DEVELOPER POWDER CONTAINER
Stanford C. Stone, South St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Dec. 7, 1973, Ser. No. 422,885
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—210

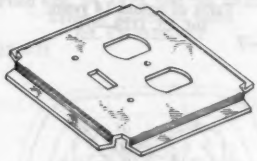
238,659
CONTAINER END
Sydney Johnstone Wallace, Allendale, N.J., assignor to American Can Company, Greenwich, Conn.
Filed Mar. 18, 1974, Ser. No. 452,004
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253



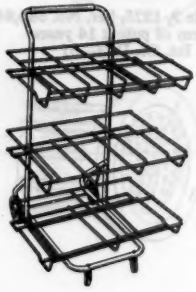
238,660
WRISTWATCH
Roland Ruefli, Grenchen, Switzerland, assignor to Montres Orfina, S.A., Grenchen, Switzerland
Filed June 4, 1974, Ser. No. 476,325
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

238,661
ORAL THERMOMETER
Zsigmond L. Sagi, Parsippany, and Berel Weinstein, Fort Lee, N.J., and John Pardo, Yonkers, N.Y., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.
Filed Jan. 28, 1974, Ser. No. 437,000
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

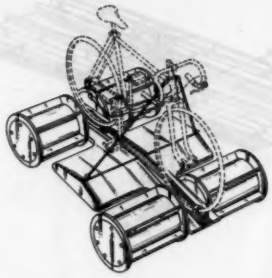
238,662
WALLPAPER TEMPLATE FOR A COMBINATION DOUBLE OUTLET AND ELECTRICAL SWITCH PLATE
John Douglass Black, 9332 Ambassador Drive, Westminster, Calif. 92683
Filed Nov. 22, 1974, Ser. No. 526,142
Term of patent 14 years
Int. Cl. D8—*09*; D19—*08*
U.S. Cl. D10—64



238,663
CART
Edward J. Schifman, Nashville, Tenn., assignor to Aladdin Industries, Inc., Nashville, Tenn.
Filed Sept. 16, 1974, Ser. No. 506,562
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—30



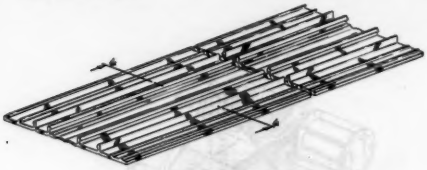
238,664
PROPULSION APPARATUS FOR WATER CYCLE
Donald F. Branstrom, 855 Portola Way, Oxnard, Calif. 93030
Filed July 8, 1974, Ser. No. 486,466
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—68

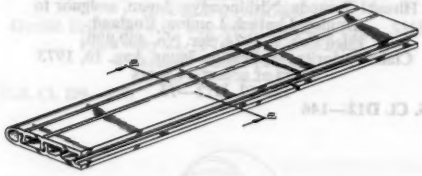


238,665
TIRE FOR A VEHICLE WHEEL
Hiroshi Tomoda, Nishinomiya, Japan, assignor to Dunlop Limited, London, England
Filed Feb. 6, 1974, Ser. No. 439,990
Claims priority, application Japan Aug. 10, 1973
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

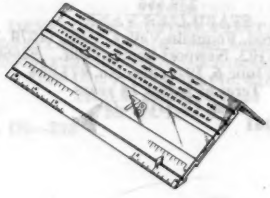
238,666
STABILIZER VANE
John A. Herrod, Fountain Valley, Calif. (1970 16th St., Apt. N103, Newport Beach, Calif. 92660)
Filed June 6, 1974, Ser. No. 477,004
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

238,667
FOLDABLE PANEL-HOLDING STRIP OR SIMILAR ARTICLE
Robert D. Bero, Westerville, Ohio, assignor to Plaskolite, Inc., Columbus, Ohio
Filed Apr. 29, 1974, Ser. No. 465,061
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



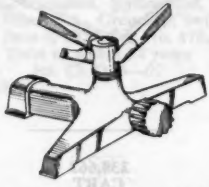


238,668
COMBINED THERMOMETER, SCALE AND PERPETUAL CALENDAR
Arthur T. Michaud, 9255 Doheny Road, Los Angeles, Calif. 90069
Filed May 15, 1974, Ser. No. 470,112
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—21

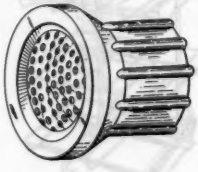


238,669
ELECTRIC PENCIL SHARPENER
Francis W. MacGregor, New Britain, Conn., assignor to Hunt Manufacturing Co., Philadelphia, Pa.
Filed Oct. 29, 1973, Ser. No. 410,628
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—73

238,670
ROTARY LAWN SPRINKLER
John D. Beamer, West Covina, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Feb. 10, 1975, Ser. No. 548,412
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7

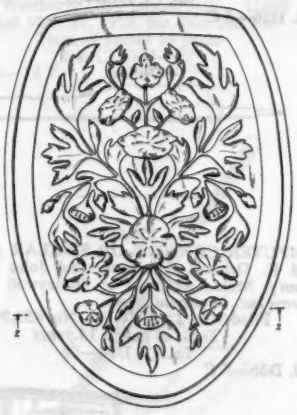


238,671
SPRAY NOZZLE
Edwin C. Rosenberger, Piqua, and Jerome A. Waker, Troy, Ohio, assignors to Chem-Lawn Corporation, Dublin, Ohio
Filed June 9, 1975, Ser. No. 584,848
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



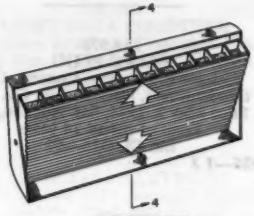
238,672
HAND HELD SHOWER SPRAY HEAD
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Jan. 15, 1975, Ser. No. 541,216
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

238,673
TOILET SEAT COVER
Henry M. Stairs, Jr., Somerville, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Feb. 24, 1975, Ser. No. 552,575
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

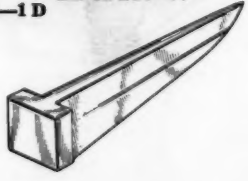


238,674
AIR FRESHENER CONTAINER OR THE LIKE
Warren J. Luedtke and Richard L. Davenport, Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed May 6, 1974, Ser. No. 467,351
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

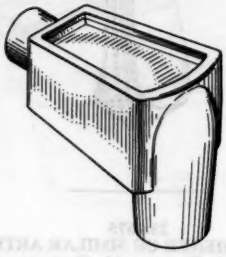
238,675
AIR FRESHENER OR SIMILAR ARTICLE
Georg Schimanski, Rummenohl, Germany, assignor to Globol-Werk GmbH, Neuburg an der Donau, Germany
Filed Sept. 12, 1974, Ser. No. 505,390
Claims priority, application Germany May 2, 1974
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



238,676
INTERDENTAL WEDGE OR SIMILAR ARTICLE
Carl-Johan Sjodahl, Orebro, Sweden, assignor to Dentalvarutjanst AB, Orebro, Sweden
Filed Oct. 9, 1974, Ser. No. 513,936
Claims priority, application Sweden May 3, 1974
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—1 D

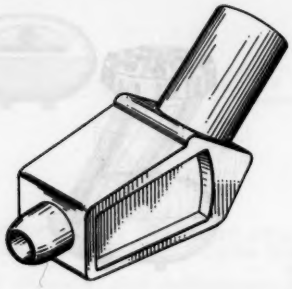


238,677
IGNITION WIRE BOOT
Richard P. Dugger, South Bend, Ind., assignor to Ristance Wire, Inc., Bremen, Ind.
Filed Jan. 6, 1975, Ser. No. 538,609
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



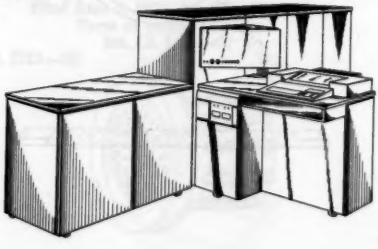
238,678
SPARK PLUG
Richard E. Hornsby, Conyers, Ga. (932 Gresham Ave. SE., Atlanta, Ga. 30316)
Filed May 2, 1974, Ser. No. 466,126
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D26—1 J

238,679
IGNITION WIRE BOOT
Richard P. Dugger, South Bend, Ind., assignor to Ristance Wire, Inc., Bremen, Ind.
Filed Jan. 6, 1975, Ser. No. 538,926
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



238,680
OPTICAL SCANNER
Arthur J. Pulos, Fayetteville, and Paul B. Sweeney, Syracuse, N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Feb. 4, 1974, Ser. No. 439,269
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

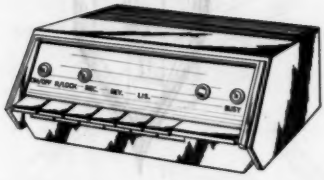
238,681
COMPUTER CONSOLE OR SIMILAR ARTICLE
Edward K. Driscoll, Marlboro, and John F. Graham, Sudbury, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed Mar. 22, 1974, Ser. No. 453,909
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



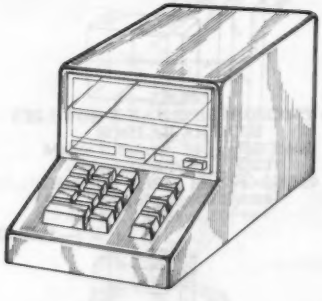
238,682
CASING FOR ELECTRICAL EQUIPMENT
Kjeld Lehmann, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed June 27, 1973, Ser. No. 374,257
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 R

238,683
ELONGATED TELEVISION ANTENNA FOR INDOOR USE
Marvin P. Middlemark, 96 Store Hill Road, Old Westbury, Long Island, N.Y. 11568
Filed Mar. 27, 1975, Ser. No. 562,795
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 F

238,684
CONFERENCE MICROPHONE OR SIMILAR ARTICLE
David K. Walz, Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.
Filed Feb. 14, 1974, Ser. No. 442,658
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D26—14 J

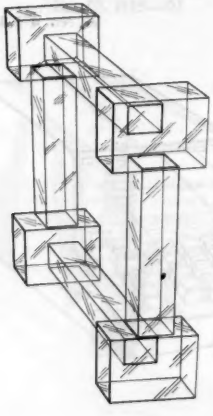


238,685
FLIGHT DATA COMPUTER
Charles S. Walters, 61st Ave., Plantation, Fla. 33317
Filed May 28, 1974, Ser. No. 473,403
Term of patent 14 years
Int. Cl. D14—*02;* D18—*01*
U.S. Cl. D26—5 C

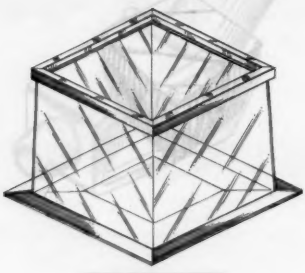


238,686
ASH COLLECTOR
William F. Martin, 350 Stonycroft Road, Ridgewood, N.J. 07450
Filed Feb. 21, 1974, Ser. No. 444,269
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—14

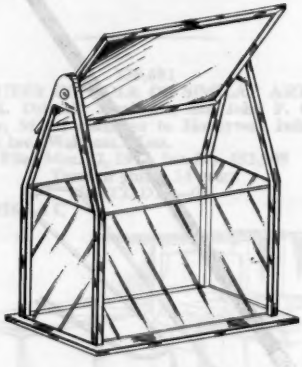
238,687
AQUARIUM
Malcolm R. Braid, 1005 Cumberland Drive, Auburn, Ala. 36830
Filed Oct. 19, 1973, Ser. No. 408,157
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6



238,688
AQUARIUM
Samuel Shalom, 577 Grand St., New York, N.Y. 10002
Filed Jan. 21, 1974, Ser. No. 435,081
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—8

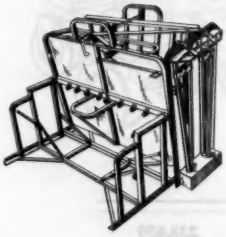


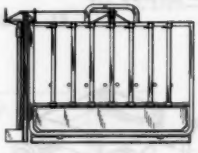
238,689
COMBINED AQUARIUM AND MIRROR
Samuel Shalom, 577 Grand St., New York, N.Y. 10002
Filed Jan. 21, 1974, Ser. No. 435,003
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—11



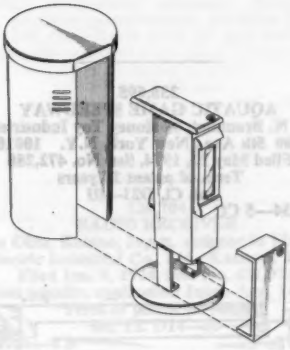
238,690
FACE FLY REPELLENT DISPENSER FOR CATTLE
Roy Goodwin, Rte. 2, Lancaster, Mo. 63548
Filed May 23, 1974, Ser. No. 473,406
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

238,691
COMBINED LIVESTOCK TILT TABLE AND HEAD GATE
Frank Kratky, Bellvue, Colo., assignor to Westguard Products, Inc., Fort Collins, Colo.
Filed Sept. 16, 1974, Ser. No. 506,432
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



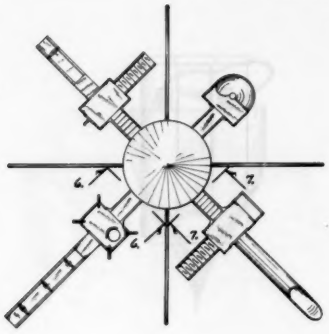


238,692
PNEUMATIC TUBE TERMINAL FOR REMOTE BANKING
Ross Cook, Rolling Hills, and Donald Keith Polgrean, Los Angeles, Calif., assignors to Ross Cook, Inc., Los Angeles, Calif., and said Polgrean, fractional part interest to each
Filed June 14, 1974, Ser. No. 479,359
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D31—22



238,693
CELL FOR X-RAY SPECTROSCOPY OR SIMILAR ARTICLE
Monte J. Solazzi, 34 Bradley Road, Scarsdale, N.Y. 10583
Filed May 1, 1974, Ser. No. 465,919
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D32—1 R

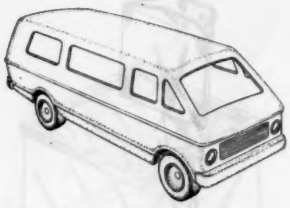
238,694
PLAYGROUND UNIT
Grant E. Jamison, Los Angeles, Calif., assignor to Jamison, Inc., Los Angeles, Calif.
Filed Mar. 18, 1974, Ser. No. 451,841
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H



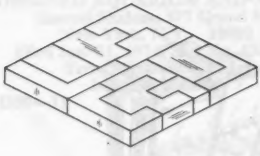
238,695
AQUATIC GAME SPEEDWAY
Harold N. Braunhut, % Honey Toy Industries, Inc., 200 5th Ave., New York, N.Y. 10010
Filed May 22, 1974, Ser. No. 472,288
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CC

238,696
AQUATIC GAME SPEEDWAY
Harold N. Braunhut, % Honey Toy Industries, Inc., 200 5th Ave., New York, N.Y. 10010
Filed May 22, 1974, Ser. No. 472,434
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CC

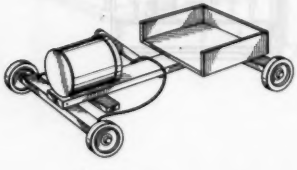
238,697
TOY VEHICLE
Tom P. McKague, 12312 SE. Steele, Portland, Oreg. 97236
Filed Feb. 1, 1974, Ser. No. 438,546
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



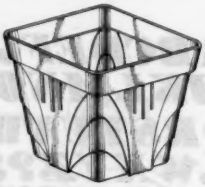
238,698
PUZZLE
Robert H. Cook, Detroit, Mich. (29084 Fairfax, Southfield, Mich. 48276)
Filed Apr. 8, 1974, Ser. No. 458,862
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



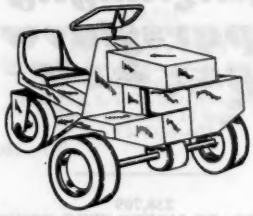
238,699
TOY COASTER
Anthony L. Hodges, 3123 41st St., San Diego, Calif. 92105
Filed July 31, 1974, Ser. No. 493,317
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



238,700
POTTED PLANT RECEPTACLE
Barnell L. Cobia, Winter Garden, Fla., assignor to Green Island International, Inc., Winter Garden, Fla.
Filed Dec. 12, 1973, Ser. No. 426,683
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

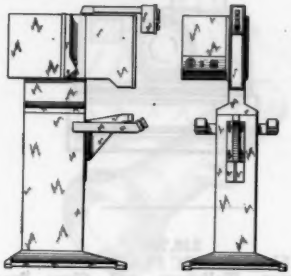


238,701
LAWN AND GARDEN TRACTOR
Donald G. Haffner, Glendale, and Knud H. Hoffmeyer and Edward J. Lazzeroni, Sr., Racine, Wis., assignors to Jacobson Manufacturing Company, Racine, Wis.
Filed Aug. 23, 1974, Ser. No. 500,143
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D40—5



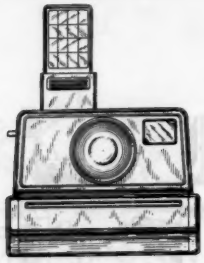
238,702
HEAD FOR A RIVETING MACHINE
Paul O. Rawson, Easton, Conn., assignor to Milford Rivet & Machine Company, Milford, Conn.
Filed Feb. 20, 1975, Ser. No. 551,273
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D54—10

238,703
PEDESTAL RIVETING MACHINE
Paul O. Rawson, Easton, Conn., assignor to Milford Rivet & Machine Company, Milford, Conn.
Filed Feb. 20, 1975, Ser. No. 551,392
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D54—10

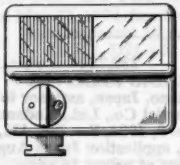


238,704
RADIO RECEIVER
Kikuo Ohta, Kntano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jan. 9, 1974, Ser. No. 431,971
Claims priority, application Japan Aug. 14, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

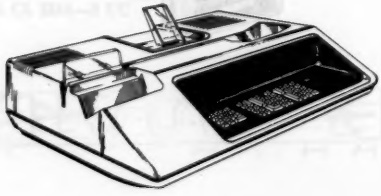
238,705
CAMERA
Ronald Emmerling, New City, N.Y., assignor to Berkey Photo, Inc., New York, N.Y.
Filed May 3, 1974, Ser. No. 466,735
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B



238,706
ELECTRONIC FLASH UNIT
Jochen Kramer, Wolfsburg, and Claus Prochnow, Braunschweig, Germany, assignors to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Aug. 27, 1974, Ser. No. 501,099
Claims priority, application Germany Mar. 4, 1974
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F

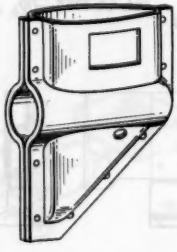


238,707
CASE FOR A CHECK ENCODER
James W. Jacobson, Saint-Nom-La-Breteche, France, and Richard G. Clayton, Detroit, and Jerry J. Sims, Southfield, Mich., assignors to Burroughs Corporation, Detroit, Mich.
Continuation-in-part of design application Ser. No. 395,276, Sept. 7, 1973. This application Mar. 6, 1975, Ser. No. 555,960
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D64—11 C



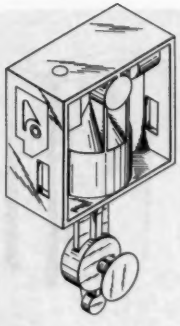
238,708
FONT OF TYPE
Thomas Paul Carnase, New York, N.Y., assignor to Playgirl, Inc., Century Park, Calif.
Filed May 6, 1974, Ser. No. 467,059
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

238,709
OUTBOARD MOTOR SKEG COVER
Filed June 3, 1974, Ser. No. 475,865
Arthur J. Rocka, Rte. 1, Box 276, Tomball, Tex. 77375
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1 A



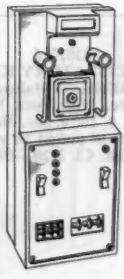
238,710
BOTTLE FOR MEDICAL LIQUID
Vincent A. Cacanindin, Chicago, Ill., assignor to American Hospital Supply Corporation, Chicago, Ill.
Filed Oct. 29, 1974, Ser. No. 518,568
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 U

238,711
DISPOSABLE PUMP CASSETTE FOR MEDICAL INFUSION PUMPS
Sydney Hudspith, San Diego, Calif., assignor to Imed Corporation, San Diego, Calif.
Filed Aug. 6, 1973, Ser. No. 386,041
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



238,712
MOUTHPIECE SENSOR FOR SPIROMETER MEDICAL APPARATUS
Bernard N. Gray, 135 Parkwood Drive, East Pepperell, Mass. 01437, and John W. Burke, 34 E. Wyoming St., Melrose, Mass. 02176
Filed Mar. 20, 1974, Ser. No. 452,815
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F

238,713
FRONT PANEL FOR A MEDICAL INFUSION PUMP
Sydney Hudspith, San Diego, Calif., assignor to Imed Corporation, San Diego, Calif.
Filed Aug. 10, 1973, Ser. No. 387,440
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



238,714
MANUALLY HELD ELECTRIC HAIR DRYER
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Mar. 1, 1974, Ser. No. 447,134
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

238,715
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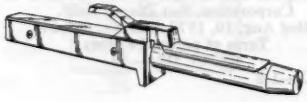
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Feb. 26, 1974, Ser. No. 445,962
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E



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Frank Michaels, Mahwah, N.J.
(1449 2nd Ave., New York, N.Y. 10021)
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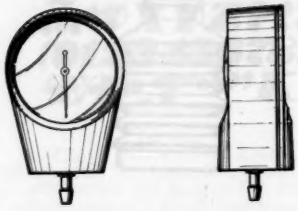
Edward Lynn Peart, Arden, and John Bayne Ashe, Asheville, N.C., assignors to Sybron Corporation, Rochester, N.Y.
Filed May 3, 1974, Ser. No. 466,694
Term of patent 14 years
Int. Cl. D10—*04;* D24—*02*
U.S. Cl. D83—12 R



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Frederick K. Bauer, P.O. Box 1705, Beverly Hills, Calif. 90213
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Joel A. Howard, Fort Lee, N.J., assignor to Howard Hardware Products, Inc., Bloomfield, N.J.
Filed Jan. 14, 1974, Ser. No. 433,199
Term of patent 14 years
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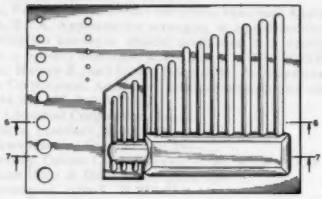

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Gerald E. White, 53 Plainfield Road, Albertson, N.Y. 11507
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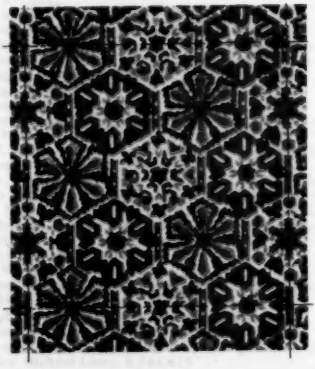

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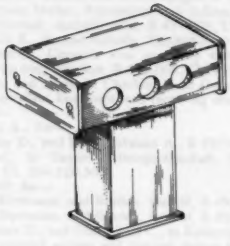

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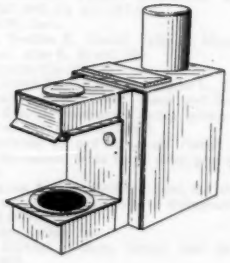
Stewart L. Black, Lee's Summit, Mo., assignor to The Vendo Company, Kansas City, Mo.
Filed Oct. 21, 1974, Ser. No. 516,434
Term of patent 14 years
Int. Cl. D7—*02*; D15—*08*
U.S. Cl. D94—3 B



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Hoffmann, Hellmut; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. N,N-dimethyl-O-(1-methyl-3-N-methylcarbaminyl-methylpyrazol(5)yl)-carbamic acid ester. B 566,464, Cl. 424-273.000.

Holt, Brian, to Ciba-Geigy Corporation. Azine derivatives of piperidine. B 506,648, Cl. 260-45.80N.

Hornagold, John T., to American Hoist & Derrick Company. Self-storing outrigger float assembly. B 583,051, Cl. 280-150.500.

Hornle, Reinhold: *See—*
Wolf, Karlheinz; Nonn, Konrad; Hornle, Reinhold; Unterbirker, Hans; and Koerner, Jurgen, B 422,063.

Hovanec, Thomas R.: *See—*
Wehrli, Henry A., II; DeMario, Edmond E.; and Hovanec, Thomas R., B 396,164.

Howarth, Arthur M.: *See—*
Fathergill, Rex D.; Howarth, Arthur M.; and Soard, Edward L., B 579,116.

Huebner, Charles Ferdinand, to Ciba-Geigy Corporation. 4-Piperidinobutyrophenones as neuroleptics. B 407,737, Cl. 424-267.000.

Hull, Thomas Neil, Jr.: *See—*
Chamay, Anthony Joseph; Smith, James; and Hull, Thomas Neil, Jr., B 445,459.

Illinois Tool Works Inc.: *See—*
Jorgensen, Arne R., B 521,986.

International Business Machines Corporation: *See—*
Berkman, John Worrall; and Pexton, Frederic Cyrus, B 494,806.
Bernstein, William A.; and Doggett, Robert H., B 461,336.
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Jones, Gardner D., Jr., B 534,016.
Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., B 496,500.
Tseng, Samuel Chin-Chong, B 537,722.

Ishikawa, Makoto: *See—*
Kono, Osamu; Matsudaira, Takeshi; and Ishikawa, Makoto, B 513,756.

Jaegtnes, Karl O., to Westinghouse Electric Corporation. Positioning device for a turbine rotor position sensor. B 471,735, Cl. 415-14.000.

Johnson, Charles H.: *See—*
Borsuk, Alvin; and Johnson, Charles H., B 557,299.

Johnson, Gordon Carlton; Metzler, Richard Bruce; and Bailey, Donald Leroy, to Union Carbide Corporation. Quadripolymer siloxanes containing Si-H bonds. B 390,408, Cl. 260-448.20H.

Jones, Gardner D., Jr., to International Business Machines Corporation. Digital automatic gain control circuit. B 534,016, Cl. 235-154.000.

Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., to International Business Machines Corporation. Method of information transmission with priority scheme in a time-division multiplex communication system comprising a loop line. B 496,500, Cl. 179-15.0AL.

Jorgensen, Arne R., to Illinois Tool Works Inc. Boring bar with removable and indexable cutting insert. B 521,986, Cl. 408-146.000.

Kamikawa, Kiyohide, to Shimano Industrial Company, Ltd. Device for rotating a spool of a fishing reel. B 518,999, Cl. 74-546.000.

Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, to Bell Telephone Laboratories, Incorporated. Thin-film optical waveguide. B 381,985, Cl. 350-96.0WG.

Katz, Leonard R.; Marshall, James R.; and Desmarchais, Walter E., to Westinghouse Electric Corporation. Fuel transfer system for a nuclear reactor. B 373,344, Cl. 214-18.00N.

Katzer, Ernst, to Knorr-Bremse GmbH. Centering device for a rail brake magnet unit. B 567,435, Cl. 188-165.000.

Kauffman, Robert N.: *See—*
Smith, James D. B.; and Kauffman, Robert N., B 441,605.

Kihara, Nobutoshi, to Sony Corporation. Video recording and/or reproducing apparatus, and record assembly for use therein. B 500,176, Cl. 360-81.000.

King, David Philip: *See—*
Appleford, David Dale; and King, David Philip, B 528,401.

King, Harold W. Hot stamping die chase. B 562,813, Cl. 425-384.000.

Kinney, Alfred W., to Phillips Petroleum Company. Method and apparatus for filling containers. B 508,878, Cl. 53-77.000.

Klomp, Edward D., to General Motors Corporation. Rotary engine combustion arrangement. B 570,172, Cl. 123-8.450.

Knorr-Bremse GmbH: *See—*
Katzer, Ernst, B 567,435.

Koen, Toshiharu, to Victor Company of Japan, Limited; and Nifco Inc. Push-pull-lock device for slide shaft. B 513,789, Cl. 403-107.000.

Koerner, Jurgen: *See—*
Wolf, Karlheinz; Nonn, Konrad; Hornle, Reinhold; Unterbirker, Hans; and Koerner, Jurgen, B 422,063.

Kogelnik, Herwig Werner: *See—*
Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, B 381,985.

Kono, Osamu; Matsudaira, Takeshi; and Ishikawa, Makoto, to Sony Corporation. Amplifying circuit for use with a high impedance source transducer. B 513,756, Cl. 179-1.00A.

Korach, Malcolm: *See—*
Foster, Robbie T.; Darlington, William B.; and Korach, Malcolm, B 402,929.

Krapcho, John, to E. R. Squibb & Sons, Inc. Anti-inflammatory agents. B 348,433, Cl. 260-244.00R.

Krogseng, Gerald P.; and Paul, Fred R., Jr., to Minnesota Mining and Manufacturing Company. Ballistic inoculation of animals and projectile therefor. B 524,121, Cl. 128-260.000.

Krolik, Kenneth J., to Motorola, Inc. Beta compensated integrated current mirror. B 508,961, Cl. 357-36.000.

Laurer, George J.: *See—*
Cowardin, Robert L.; and Laurer, George J., B 560,765.

LaVia, Anthony Laurence; and Hill, John Anthony, to E. R. Squibb & Sons, Inc. Sweetening compositions. B 439,778, Cl. 426-548.000.

Lestage, Joseph C.: *See—*
Van Brussel, William R.; Lestage, Joseph C.; and Hartman, Wayne J., B 559,954.

Levine, Seymour D.: *See—*
Stiller, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., B 510,850.

Lewis, Paul A., to Union Carbide Corporation. Seed coating. B 548,028, Cl. 47-57.600.

Lin, Yeong S.; Liu, Chao N.; and Tang, Donald T. Cryptographic magnetic bubble domain memory. B 455,425, Cl. 340-174.0TF.

Linden-Alimak AB: *See—*
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Liu, Chao N.: *See—*
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Lo, Gerald Joy-Pak; Papworth, Francis Leo; Tenne-Sens, Nicolas Elmars; O'Donovan, Michael Valentine; and Dziub, Gerald, to RCA Corporation. Metal plated body composed of graphite fibre epoxy composite. B 339,194, Cl. 333-73.00W.

Lossev, Alexander. Traction means for resilient tires of motor vehicles. B 445,690, Cl. 152-213.00R.

Luisi, James A.; Padgett, Clarence W.; and Street, Dana C., to Rockwell International Corporation. High speed-low cost, clock controlled CMOS logic implementation. B 513,368, Cl. 307-205.000.

Maier, Hans-Peter: *See—*
von der Eltz, Hans-Ulrich; and Maier, Hans-Peter, B 497,473.

Malifaud, Pierre, to Ste de Recherche et de Promotion d'Activities Nouvelles ACNO. Optical projectors. B 454,283, Cl. 240-41.35R.

Mallinckrodt Chemical Works, now by change of name Mallinckrodt, Inc.: *See—*
Eloy, Fernand G. F.; and Shanahan, Robert W., B 426,639.

Mares, Frantisek, to Allied Chemical Corporation. Process for producing caprolactam from 6-aminocaproic acid. B 506,148, Cl. 260-239.30A.

Marshall, James R.: *See—*
Katz, Leonard R.; Marshall, James R.; and Desmarchais, Walter E., B 373,344.

Martin, Edouard: *See—*
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Mascioli, Rocco L.: *See—*
Bechara, Ibrahim S.; Carroll, Felix P.; Mascioli, Rocco L.; and Panchak, John R., B 497,194.

Massey, Arie F., Jr., to Robertshaw Controls Company. Valve construction and method of making the same. B 490,589, Cl. 251-319.000.

Matsudaira, Takeshi: *See—*
Kono, Osamu; Matsudaira, Takeshi; and Ishikawa, Makoto, B 513,756.

Mayer-Mader, Rudolf; and Boldt, Jurgen, to Bayer Aktiengesellschaft. Mixture of benzene-soluble and benzene-insoluble chloroprene polymers wherein the former polymer is prepared in the presence of a dialkoxyxanthogendisulphide. B 495,408, Cl. 260-890.000.

McDowell, William; and Weingarten, Rudolf, to Hoechst Aktiengesellschaft. Process for the dyeing of synthetic fibres with water-insoluble dyestuffs from organic solvents according to the exhaustion method. B 344,967, Cl. 8-174.000.

McKenna, George E., to Phillips Petroleum Company. Vaporization of oil feed by addition of regenerated catalyst. B 467,250, Cl. 208-78.000.

McKenzie, Patrick J.: *See—*
Chaprnka, Anthony G.; and McKenzie, Patrick J., B 495,759.

Metzler, Richard Bruce: *See—*
Johnson, Gordon Carlton; Metzler, Richard Bruce; and Bailey, Donald Leroy, B 390,408.

Miller, Charles William, to Minnesota Mining & Manufacturing Company. Audio circuit with noise muting feature. B 403,477, Cl. 360-80.000.

Miller, Robert C.: *See—*
Nalepa, Philip J.; Emtage, Peter R.; and Miller, Robert C., B 585,731.

Minnesota Mining and Manufacturing Company: *See—*
Dreyer, John F., B 522,309.
Fayling, Richard E., B 283,941.
Krogseng, Gerald P.; and Paul, Fred R., Jr., B 524,121.
Miller, Charles William, B 403,477.
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Monsanto Limited: *See—*
Appleford, David Dale; and King, David Philip, B 528,401.

Mori, Yoshihisa; Shimura, Kazuo; and Watanabe, Hiroyuki, to Sony Corporation. Pickup cartridge. B 526,388, Cl. 274-37.000.

Motorola, Inc.: *See—*
Krolik, Kenneth J., B 508,961.
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Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., B 496,500.
Mueller, Otward: *See—*
Crockett, William B.; and Mueller, Otward, B 553,460.
Muller, Friedhelm: *See—*
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Munden, Curtis D.; and Campbell, Robert E., to General Motors Corporation. Electrical angle delay circuit. B 519,932, Cl. 307-293.000.
Muss, Daniel R.: *See—*
Nathanson, Harvey C.; Guldberg, Jens; and Muss, Daniel R., B 442,970.
Nalepa, Philip J.; Emtage, Peter R.; and Miller, Robert C., to Westinghouse Electric Corporation. Composition for VO_2 incandescent lamp current inrush limiters. B 585,731, Cl. 252-518.000.
Narayanan, Venkatachala Lakshmi; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Anthelmintic isothiocyanobenzoxazoles. B 486,280, Cl. 260-307.00D.
Nathanson, Harvey C.; Guldberg, Jens; and Muss, Daniel R., to Westinghouse Electric Corporation. Optical imaging system utilizing a light valve array and a coupled photoemissive target. B 442,970, Cl. 178-7.30D.
National Can Corporation: *See—*
Traczyk, Edward S.; Quinton, Jack; and Warnell, Walter C., B 546,631.
Needham, Riley B., to Phillips Petroleum Company. Method of recovering oil using steam. B 529,836, Cl. 166-303.000.
Newell, William H., to Perkin-Elmer Corporation, The. X, Y, θ alignment mechanism. B 509,586, Cl. 74-479.000.
Nielsen, Donald R., to PPG Industries, Inc. Trisulfosuccinic acid. B 494,669, Cl. 260-513.00R.
Nifco Inc.: *See—*
Koen, Toshiharu, B 513,789.
Nonn, Konrad: *See—*
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Norton Company: *See—*
Scott, John J., B 522,038.
O'Donovan, Michael Valentine: *See—*
Lo, Gerald Joy-Pak; Papworth, Francis Leo; Tenne-Sens, Nicolas Elmars; O'Donovan, Michael Valentine; and Dziub, Gerald, B 339,194.
Oediger, Hermann; and Braden, Rudolf, to Bayer Aktiengesellschaft. Coumaranedione-3-monoximes. B 495,550, Cl. 260-343.30R.
Oediger, Hermann; and Braden, Rudolf, to Bayer Aktiengesellschaft. 3-Amidocoumaranones. B 495,554, Cl. 260-343.30R.
Orihara, Yasunori: *See—*
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Orlando, Carl, to United States of America, Army. Image stabilization system. B 533,580, Cl. 354-70.000.
Oscar Mayer & Co. Inc.: *See—*
Borsuk, Alvin; and Johnson, Charles H., B 557,299.
Ovation Instruments, Inc.: *See—*
Rickard, James H., B 556,897.
P. R. Mallory & Co. Inc.: *See—*
Weber, Richard H., B 494,383.
Pacault, Pierre Henri, to Fives-Cail Babcock. Thermal power plant. B 538,472, Cl. 60-645.000.
Padgett, Clarence W.: *See—*
Luisi, James A.; Padgett, Clarence W.; and Street, Dana C., B 513,368.
Panchak, John R.: *See—*
Bechara, Ibrahim S.; Carroll, Felix P.; Mascioli, Rocco L.; and Panchak, John R., B 497,194.
Papworth, Francis Leo: *See—*
Lo, Gerald Joy-Pak; Papworth, Francis Leo; Tenne-Sens, Nicolas Elmars; O'Donovan, Michael Valentine; and Dziub, Gerald, B 339,194.
Paul, Fred R., Jr.: *See—*
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Perkin-Elmer Corporation, The: *See—*
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Pexton, Frederic Cyrus: *See—*
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Phillips Petroleum Company: *See—*
Bennett, Richard J.; Buck, Ollie G.; and Buster, John L., B 434,206.
Clampitt, Richard L., B 569,519.
Fernandez, Miguel A., B 497,292.
Fozzard, George B., B 330,736.
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Turk, Stanley D.; and Drake, Charles A., B 398,084.
Turk, Stanley D.; and Drake, Charles A., B 456,900.
PPG Industries, Inc.: *See—*
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Foster, Robbie T.; Darlington, William B.; and Korach, Malcolm, B 402,929.
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Principe, Pacifico A.: *See—*
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Rahaim, Thomas J.: *See—*
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RCA Corporation: *See—*
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Lo, Gerald Joy-Pak; Papworth, Francis Leo; Tenne-Sens, Nicolas Elmars; O'Donovan, Michael Valentine; and Dziub, Gerald, B 339,194.
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Reflexite Corporation: *See—*
Rowland, William P., B 586,663.
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Rey, Hans-Georg; Rittersdorf, Walter; and Busch, Ernst-Werner, to Boehringer Mannheim G.m.b.H. Method for the detection of fatty substances on surfaces. B 426,424, Cl. 424-9.000.
Ricci, Louis N.: *See—*
Farley, James R.; Salvati, John G.; and Ricci, Louis N., B 509,606.
Rickard, James H., to Ovation Instruments, Inc. Pickup mounting for stringed instrument. B 556,897, Cl. 84-1.160.
Rittersdorf, Walter: *See—*
Rey, Hans-Georg; Rittersdorf, Walter; and Busch, Ernst-Werner, B 426,424.
Roberts, John S., to Westinghouse Electric Corporation. Method of making a light activated semiconductor controlled rectifier. B 561,732, Cl. 29-578.000.
Robertshaw Controls Company: *See—*
Branson, Charles D.; and Demi, Roy C., B 530,605.
Branson, Charles D., B 558,813.
Flumm, Paul T.; and Harris, Vernon B., B 516,825.
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Stearley, John W.; and Warner, Roger L., B 585,247.
Rockwell International Corporation: *See—*
Luisi, James A.; Padgett, Clarence W.; and Street, Dana C., B 513,368.
Root, Russell L., to Addressograph Multigraph Corporation. Pressure fixing of toners. B 493,501, Cl. 355-17.000.
Rowland, William P., to Reflexite Corporation. Retroreflective sheet material with controlled stretch and method of making same. B 586,663, Cl. 350-103.000.
Salvati, John G.: *See—*
Farley, James R.; Salvati, John G.; and Ricci, Louis N., B 509,606.
Sandler, Yehuda L., to Westinghouse Electric Corporation. Electrochemical Sensor for reactive gas mixtures. B 843,038, Cl. 204-195.00S.
Santi, John D.; and Boyd, Edward A., to Briggs & Stratton Corporation. Method of plugging armature slots. B 555,437, Cl. 264-161.000.
Santilli, Vincent J.; and Vine, James, to Westinghouse Electric Corporation. Gateable electron image intensifier. B 518,859, Cl. 313-99.000.
Schaupp, Kurt, to Bayer Aktiengesellschaft. Mortar of inorganic binder and formaldehyde condensation product of sulfonated aromatic ether, imine or sulfone. B 465,955, Cl. 260-37.00R.
Schilling, Guenther; and Dobson, Thomas A., to American Home Products Corporation. Purification of γ-oxo-2-dibenzofuranbutyric acid. B 302,160, Cl. 260-346.20M.
Schon, Nikolaus: *See—*
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Scott, John J., to Norton Company. Progressively or continuously cycled mold for forming and discharging a fine crystalline material. B 522,038, Cl. 164-330.000.
Serizawa, Akio, to Sony Corporation. Resilient tape guide assembly for rotary head tape recording and/or reproducing apparatus. B 579,806, Cl. 360-130.000.
Shanahan, Robert W.: *See—*
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Shimano Industrial Company, Ltd.: *See—*
Kamikawa, Kiyohide, B 518,999.
Shimura, Kazuo: *See—*
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Shurtleff, Edgar M., to United States of America, Army. Infrastar cannister cartridge. B 443,163, Cl. 102-42.00R.
Smith, James: *See—*
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Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corporation. Carboxylic acid storage stabilizers for latent catalyst cured epoxy resins. B 441,605, Cl. 260-37.0EP.
Soard, Edward L.: *See—*
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Sony Corporation: *See—*
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Srinivasan, Rangaswamy: *See—*
Angadiyavar, Channabasappa S.; and Srinivasan, Rangaswamy, B 506,916.

Stacey, Eric J., to Westinghouse Electric Corporation. Force commutation static frequency changer apparatus using direct capacitor commutation. B 509,185, Cl. 321-7.000.

Stafstrom, Gustave T., to Waterbury Buckle Company. Separable fastener. B 532,475, Cl. 24-75.000.

Stauffer Chemical Company: *See—*
Gutman, Arnold G., B 576,903.

Ste de Recherche et de Promotion d'Activities Nouvelles ACNO: *See—*
Malifaud, Pierre, B 454,283.

Stearley, John W.; and Warner, Roger L., to Robertshaw Controls Company. Electrical switch construction. B 585,247, Cl. 200-67.00D.

Stern, Hansjoerg, to General Electric Company. Frequency modulated fluidic gauge. B 532,319, Cl. 73-37.700.

Stiller, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., to E. R. Squibb & Sons, Inc. Method of using fluorene-2-acetic acid derivatives. B 510,850, Cl. 424-317.000.

Stolzer, Claus; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. S-(Alkoxycarbonyl-alkyl-thiophosphoric acid ester amides. B 386,673, Cl. 260-942.000.

Street, Dana C.: *See—*
Luisi, James A.; Padgett, Clarence W.; and Street, Dana C., B 513,368.

Strehlow, Wolfgang H., to Minnesota Mining & Manufacturing Co. Retroreflective material including geometric fresnel zone plates. B 548,440, Cl. 350-320.000.

Sun Oil Company of Pennsylvania: *See—*
Young, Einar T.; and Tinklepaugh, Robert L., B 528,756.

Sun Ventures, Inc.: *See—*
Driscoll, Gary L.; and Haseltine, Marcus W., Jr., B 464,587.

Tang, Donald T.: *See—*
Lin, Yeong S.; Liu, Chao N.; and Tang, Donald T., B 455,425.

Taylor, C. R., Jr.: *See—*
Helsley, Grover C.; and Taylor, C. R., Jr., B 477,481.

Taylor, Derek, to Bunker Ramo Corporation. Trimming potentiometer with coarse and fine adjustment means. B 489,526, Cl. 338-166.000.

Tenne-Sens, Nicolas Elmars: *See—*
Lo, Gerald Joy-Pak; Papworth, Francis Leo; Tenne-Sens, Nicolas Elmars; O'Donovan, Michael Valentine; and Dziub, Gerald, B 339,194.

Theidel, Hans: *See—*
Hartmann, Peter; and Theidel, Hans, B 440,858.

Thompson, Francis T., to Westinghouse Electric Corporation. Feedback field control for an electric vehicle. B 475,236, Cl. 318-139.000.

Thompson, Russell G.: *See—*
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Tinklepaugh, Robert L.: *See—*
Young, Einar T.; and Tinklepaugh, Robert L., B 528,756.

Tomioka, Masao; and Orihara, Yasunori, to Sony Corporation. Overload protection circuit for tape recording and/or reproducing apparatus. B 501,253, Cl. 360-85.000.

Traczyk, Edward S.; Quinton, Jack; and Warnell, Walter C., to National Can Corporation. Method and apparatus for necking and flanging containers. B 546,631, Cl. 72-#3.000.

Tseng, Samuel Chin-Chong, to International Business Machines Corporation. Optical digital to analog converter. B 537,722, Cl. 350-96.0WG.

Turk, Stanley D.; and Drake, Charles A., to Phillips Petroleum Company. Conversion of aliphatic nitriles to carboxylic acids using cyclic acid anhydrides. B 398,084, Cl. 260-326.00R.

Turk, Stanley D.; and Drake, Charles A., to Phillips Petroleum Company. Method of promoting the reaction of unsaturated nitriles with olefins to produce unsaturated nitriles of increased carbon number. B 456,900, Cl. 260-465.900.

Ukeiley, Richard Larry, to Bell Telephone Laboratories, Incorporated. Automatic cable balancing network. B 541,415, Cl. 179-170.00D.

Union Carbide Corporation: *See—*
Johnson, Gordon Carlton; Metzler, Richard Bruce; and Bailey, Donald Leroy, B 390,408.
Lewis, Paul A., B 548,028.

United States of America
Army: *See—*
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Health, Education and Welfare: *See—*
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Unterbirker, Hans: *See—*
Wolf, Karlheinz; Nonn, Konrad; Hornle, Reinhold; Unterbirker, Hans; and Koerner, Jurgen, B 422,063.

Vaiden, Henry Edge, to Bell Telephone Laboratories, Incorporated. Apparatus for testing multiconductor cables for continuity, correct connections, and the absence of short circuits between conductors. B 534,767, Cl. 324-51.000.

Van Brussel, William R.; Lestage, Joseph C.; and Hartman, Wayne J., to United States of America, Army. Dispenser for explosives having adjustable trap chamber. B 559,954, Cl. 222-306.000.

Vardell, William G.: *See—*
Ward, Benjamin F.; and Vardell, William G., B 527,999.

Victor Company of Japan, Limited: *See—*
Koen, Toshiharu, B 513,789.

Vine, James: *See—*
Santilli, Vincent J.; and Vine, James, B 518,859.

von der Eltz, Hans-Ulrich; and Maier, Hans-Peter, to Hoechst Aktiengesellschaft. Process for obtaining irregular shadow dyeings on polyester fibers and mixtures thereof. B 497,473, Cl. 8-14.000.

Waku, Toshihiko, to Sony Corporation. Temperature compensated variable frequency crystal oscillator. B 527,693, Cl. 331-116.00R.

Ward, Benjamin F.; and Vardell, William G., to Westvaco Corporation. Corrosion inhibiting compositions and process for inhibiting corrosion of metals. B 527,999, Cl. 21-2.70R.

Warnell, Walter C.: *See—*
Traczyk, Edward S.; Quinton, Jack; and Warnell, Walter C., B 546,631.

Warner, Roger L.: *See—*
Stearley, John W.; and Warner, Roger L., B 585,247.

Watanabe, Hiroyuki: *See—*
Mori, Yoshihisa; Shimura, Kazuo; and Watanabe, Hiroyuki, B 526,388.

Waterbury Buckle Company: *See—*
Stafstrom, Gustave T., B 532,476.

Weber, Richard H., to P. R. Mallory & Co. Inc. Automatic timer. B 494,383, Cl. 200-38.0FA.

Wehrli, Henry A., II; DeMario, Edmond E.; and Hovanec, Thomas R., to Westinghouse Electric Corporation. Pressurized fuel elements for nuclear reactors. B 396,164, Cl. 176-68.000.

Weingarten, Rudolf: *See—*
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Weitzenhof, David A.: *See—*
Bank, Thomas A.; Gieck, Jack E.; and Weitzenhof, David A., B 552,932.

Werner, Lincoln Harvey, to Ciba-Geigy Corporation. 4-Ethers of 3-amino-5-sulfamoylbenzoic acids. B 386,828, Cl. 260-516.000.

Westinghouse Electric Corporation: *See—*
Booher, Claude R., Jr.; and Rahaim, Thomas J., B 552,006.
Brennen, Michael B.; and Abbondanti, Alberto, B 511,886.
Chaprnka, Anthony G.; and McKenzie, Patrick J., B 495,759.
Eley, Edgar R., B 531,425.
Farley, James R.; Salvati, John G.; and Ricci, Louis N., B 509,606.
Frisch, Erling, deceased; and Andrews, Harry N., B 367,621.
Jaegtnes, Karl O., B 471,735.
Katz, Leonard R.; Marshall, James R.; and Desmarchais, Walter E., B 373,344.
Nalepa, Philip J.; Emtage, Peter R.; and Miller, Robert C., B 585,731.
Nathanson, Harvey C.; Guldberg, Jens; and Muss, Daniel R., B 442,970.
Reitboeck, Heribert J. P., B 358,427.
Roberts, John S., B 561,732.
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Santilli, Vincent J.; and Vine, James, B 518,859.
Smith, James D. B.; and Kauffman, Robert N., B 441,605.
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Thompson, Francis T., B 475,236.
Wehrli, Henry A., II; DeMario, Edmond E.; and Hovanec, Thomas R., B 396,164.
Wonn, James W.; and Bannister, Ronald L., B 557,153.

Westvaco Corporation: *See—*
Ward, Benjamin F.; and Vardell, William G., B 527,999.

Wild, Daniel: *See—*
Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., B 496,500.

Wolf, Karlheinz; Nonn, Konrad; Hornle, Reinhold; Unterbirker, Hans; and Koerner, Jurgen, to Bayer Aktiengesellschaft. Process for the production of coloured polyurethane foams. B 422,063, Cl. 260-2.5AM.

Wonn, James W.; and Bannister, Ronald L., to Westinghouse Electric Corporation. Moisture indicating apparatus. B 557,153, Cl. 73-29.000.

Woods, Eric R.; and Thompson, Russell G., to General Dynamics Corporation. Television signal amplifier apparatus for counteracting effects of unwanted signal components. B 519,979, Cl. 178-7.100.

Yew, Ming-Chih, to General Motors Corporation. Jet ignition engine with valve-carried ignition chamber. B 563,780, Cl. 123-75.00B.

Young, Einar T.; and Tinklepaugh, Robert L., to Sun Oil Company of Pennsylvania. High temperature gas chromatograph valve. B 528,756, Cl. 137-625.460.

Zafiropulo, Pitro A.: *See—*
Jones, Ivor; Mueller, Hans R.; Wild, Daniel; and Zafiropulo, Pitro A., B 496,500.

CLASSIFICATION OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DATE PUBLISHED FEBRUARY 3, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 8			
10.2	B 430,334	C	Jan. 27, 1976
14	B 460,388	C	Jan. 27, 1976
	B 497,473	C	Feb. 3, 1976
17	B 458,060	C	Jan. 13, 1976
115.7	B 389,304	C	Jan. 27, 1976
142	B 423,867	C	Feb. 3, 1976
161	B 461,352	C	Jan. 13, 1976
174	B 344,967	C	Feb. 3, 1976
Class 15			
256.53	B 579,116	M	Feb. 3, 1976
Class 17			
2502	B 541,496	E	Jan. 27, 1976
Class 21			
2.7R	B 527,999	C	Feb. 3, 1976
Class 23			
285F	B 565,180	C	Jan. 27, 1976
Class 24			
75	B 532,476	M	Feb. 3, 1976
Class 28			
1.6	B 497,292	M	Feb. 3, 1976
Class 29			
96	B 546,911	M	Jan. 13, 1976
127	B 510,855	M	Jan. 27, 1976
428	B 520,928	M	Jan. 13, 1976
578	B 561,732	M	Feb. 3, 1976
580	B 492,301	M	Jan. 13, 1976
Class 32			
10A	B 491,501	M	Jan. 13, 1976
Class 37			
8	B 558,819	M	Feb. 3, 1976
142A	B 511,099	M	Feb. 3, 1976
Class 47			
57.6	B 548,028	M	Feb. 3, 1976
Class 52			
484	B 522,354	M	Jan. 20, 1976
Class 53			
77	B 508,878	M	Feb. 3, 1976
Class 55			
105	B 490,806	C	Feb. 3, 1976
352	B 543,941	C	Jan. 13, 1976
Class 56			
14.5	B 549,244	M	Jan. 27, 1976
Class 58			
21.13	B 516,825	M	Feb. 3, 1976
Class 60			
226A	B 445,459	M	Feb. 3, 1976
304	B 502,540	M	Jan. 13, 1976
422	B 526,445	M	Jan. 20, 1976
424	B 584,520	M	Jan. 27, 1976
425	B 535,386	M	Jan. 13, 1976
592	B 465,145	M	Jan. 27, 1976
645	B 538,472	M	Feb. 3, 1976
Class 61			
.5	B 554,283	M	Jan. 27, 1976
Class 62			
353	B 564,314	M	Jan. 20, 1976
Class 65			
3A	B 532,969	C	Jan. 13, 1976
239	B 545,777	C	Jan. 27, 1976
Class 71			
113	B 535,076	C	Jan. 20, 1976
Class 72			
43	B 546,631	M	Feb. 3, 1976
88	B 575,757	M	Jan. 27, 1976
Class 73			
24	B 506,744	M	Jan. 13, 1976
29	B 557,153	M	Feb. 3, 1976
37.7	B 532,319	M	Feb. 3, 1976
67.5H	B 522,309	M	Feb. 3, 1976
147	B 521,620	M	Jan. 27, 1976
302	B 464,290	M	Feb. 3, 1976
437	B 528,401	M	Feb. 3, 1976
Class 74			
242.1A	B 567,854	M	Feb. 3, 1976
243C	B 558,818	M	Jan. 13, 1976
479	B 509,586	M	Feb. 3, 1976
481	B 497,021	M	Jan. 13, 1976
527	B 470,170	M	Jan. 13, 1976
546	B 518,999	M	Feb. 3, 1976
Class 75			
.5BA	B 385,631	C	Jan. 27, 1976
135	B 525,961	C	Jan. 13, 1976
Class 83			
425	B 545,935	M	Jan. 27, 1976
Class 84			
1.16	B 556,897	M	Feb. 3, 1976
275	B 504,169	M	Jan. 13, 1976
Class 86			
1R	B 356,187	M	Jan. 20, 1976
Class 96			
1R	B 423,883	C	Jan. 27, 1976
1.4	B 200,759	C	Feb. 3, 1976
36.1	B 359,901	C	Jan. 13, 1976
78	B 503,029	C	Jan. 27, 1976
Class 99			
335	B 557,299	M	Feb. 3, 1976
Class 101			
93.13	B 496,999	M	Jan. 27, 1976
93.14	B 481,600	M	Jan. 27, 1976
129	B 416,589	M	Jan. 27, 1976
Class 102			
32	B 405,726	M	Jan. 13, 1976
42R	B 443,163	M	Feb. 3, 1976
69	B 412,068	M	Jan. 13, 1976
Class 106			
27	B 452,883	C	Jan. 27, 1976
57	B 502,773	C	Jan. 13, 1976
Class 109			
1SB	B 358,427	E	Feb. 3, 1976
Class 116			
124.4	B 467,412	M	Jan. 13, 1976
Class 123			
8.45	B 570,172	M	Feb. 3, 1976
75B	B 563,780	M	Feb. 3, 1976
182	B 558,251	M	Jan. 13, 1976
325T	B 425,588	M	Jan. 13, 1976
Class 126			
271	B 512,745	M	Jan. 13, 1976
350A	B 537,903	M	Jan. 20, 1976
Class 128			
260	B 524,121	M	Feb. 3, 1976
419P	B 535,466	M	Jan. 27, 1976
Class 131			
144	B 586,387	M	Feb. 3, 1976
Class 136			
202	B 378,513	C	Jan. 27, 1976
Class 137			
596.12	B 514,687	M	Jan. 27, 1976
614.11	B 530,605	M	Feb. 3, 1976
625.46	B 528,756	M	Feb. 3, 1976
798	B 430,172	M	Jan. 13, 1976
Class 140			
92.1	B 590,159	M	Feb. 3, 1976
Class 144			
241	B 545,630	M	Jan. 27, 1976

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		CAT.	PUB. DATE
Class 152			
213R	B 445,690	M	Feb. 3, 1976
Class 156			
3	B 563,722	C	Jan. 13, 1976
71	B 456,148	C	Jan. 13, 1976
73.6	B 414,481	C	Jan. 20, 1976
143	B 462,386	C	Jan. 13, 1976
Class 160			
229R	B 505,813	M	Jan. 13, 1976
Class 162			
133	B 431,072	C	Jan. 20, 1976
198	B 150,142	C	Jan. 27, 1976
Class 164			
26	B 499,227	M	Jan. 27, 1976
60	B 511,885	M	Jan. 27, 1976
330	B 522,038	M	Feb. 3, 1976
Class 166			
272	B 569,519	M	Feb. 3, 1976
303	B 529,836	M	Feb. 3, 1976
311	B 511,156	M	Jan. 27, 1976
Class 173			
104	B 537,709	M	Jan. 13, 1976
170	B 567,058	M	Jan. 13, 1976
Class 176			
20R	B 384,330	C	Jan. 27, 1976
36R	B 367,621	C	Feb. 3, 1976
68	B 396,164	C	Feb. 3, 1976
Class 178			
6	B 546,426	E	Jan. 27, 1976
7.1	B 519,979	E	Feb. 3, 1976
7.3D	B 442,970	E	Feb. 3, 1976
7.5R	B 508,817	E	Feb. 3, 1976
58R	B 399,908	C	Jan. 13, 1976
88	B 561,764	E	Jan. 27, 1976
Class 179			
1A	B 513,756	E	Feb. 3, 1976
1CN	B 475,681	E	Jan. 20, 1976
1SM	B 476,577	E	Jan. 20, 1976
1G	B 554,594	E	Jan. 20, 1976
7.1R	B 545,050	E	Jan. 20, 1976
15AL	B 496,500	E	Feb. 3, 1976
81R	B 472,284	E	Jan. 13, 1976
170D	B 541,415	E	Feb. 3, 1976
Class 180			
5R	B 499,171	M	Jan. 27, 1976
49	B 433,094	M	Jan. 27, 1976
53R	B 551,527	M	Jan. 13, 1976
79.2R	B 533,968	M	Jan. 27, 1976
Class 188			
73.6	B 533,056	M	Jan. 13, 1976
165	B 567,435	M	Feb. 3, 1976
218XL	B 562,698	M	Jan. 13, 1976
Class 195			
29	B 418,489	C	Jan. 13, 1976
Class 196			
14.52	B 520,384	M	Jan. 27, 1976
Class 197			
18	B 535,391	M	Jan. 27, 1976
Class 198			
129	B 569,646	M	Jan. 13, 1976
179	B 424,989	M	Feb. 3, 1976
202	B 499,352	M	Jan. 27, 1976
Class 200			
5R	B 579,104	E	Jan. 27, 1976
11TC	B 531,425	E	Feb. 3, 1976
38FA	B 494,383	E	Feb. 3, 1976
61.41	B 506,286	E	Jan. 20, 1976
67D	B 585,247	E	Feb. 3, 1976
83SA	B 428,877	E	Jan. 27, 1976
Class 202			
227	B 513,280	C	Jan. 20, 1976
Class 204			
195S	B 843,038	C	Feb. 3, 1976
Class 206			
455	B 490,067	M	Jan. 27, 1976
Class 208			
15	B 437,596	C	Jan. 27, 1976
78	B 467,250	C	Feb. 3, 1976
210	B 501,317	C	Jan. 13, 1976
253	B 438,916	C	Jan. 13, 1976
Class 210			
130	B 532,901	C	Jan. 13, 1976
Class 214			
18N	B 373,344	M	Feb. 3, 1976
58	B 555,772	M	Jan. 13, 1976
152	B 480,604	M	Jan. 13, 1976
Class 215			
216	B 541,015	M	Jan. 27, 1976
Class 220			
23.83	B 529,156	M	Jan. 13, 1976
288	B 516,032	M	Jan. 27, 1976
337	B 578,447	M	Jan. 20, 1976
Class 222			
67	B 521,480	M	Jan. 13, 1976
136	B 487,260	M	Jan. 27, 1976
306	B 559,954	M	Feb. 3, 1976
325	B 515,303	M	Jan. 20, 1976
Class 228			
190	B 473,972	M	Jan. 13, 1976
Class 229			
2.5	B 537,990	M	Jan. 13, 1976
17R	B 461,257	M	Jan. 13, 1976
62.5	B 429,157	M	Jan. 27, 1976
Class 235			
151.34	B 492,946	E	Jan. 27, 1976
152	B 559,737	E	Jan. 20, 1976
154	B 534,016	E	Feb. 3, 1976
156	B 536,009	E	Jan. 27, 1976
181	B 520,924	E	Jan. 27, 1976
Class 236			
15A	B 558,813	M	Feb. 3, 1976
Class 239			
424	B 580,921	M	Jan. 13, 1976
424	B 586,215	M	Jan. 20, 1976
Class 240			
41.35R	B 454,283	E	Feb. 3, 1976
Class 242			
43R	B 521,600	M	Jan. 27, 1976
Class 244			
134R	B 535,928	M	Jan. 13, 1976
169	B 511,346	M	Jan. 27, 1976
Class 248			
73	B 494,806	M	Feb. 3, 1976
Class 249			
135	B 548,155	M	Jan. 13, 1976
Class 250			
210	B 515,908	E	Jan. 20, 1976
227	B 522,577	E	Jan. 27, 1976
	B 560,765	E	Feb. 3, 1976
291	B 500,981	E	Jan. 27, 1976
402	B 451,534	E	Jan. 13, 1976
Class 251			
319	B 490,589	M	Feb. 3, 1976
Class 252			
301.4S	B 535,813	C	Jan. 27, 1976
364	B 370,309	C	Jan. 20, 1976
454	B 450,967	C	Jan. 13, 1976
518	B 585,731	C	Feb. 3, 1976

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		CAT.	PUB. DATE
Class 254			
188	B 437,559	M	Feb. 3, 1976
Class 259			
191	B 556,057	M	Jan. 13, 1976
Class 260			
2.5AC	B 497,194	C	Feb. 3, 1976
	B 537,102	C	Jan. 13, 1976
2.5AM	B 422,063	C	Feb. 3, 1976
2.5AR	B 483,606	C	Jan. 27, 1976
	B 502,589	C	Jan. 27, 1976
2.5AV	B 460,441	C	Jan. 13, 1976
2.5R	B 471,579	C	Jan. 13, 1976
23XA	B 483,865	C	Jan. 13, 1976
28.5AS	B 501,540	C	Jan. 13, 1976
29.2EP	B 526,997	C	Jan. 13, 1976
33.6AQ	B 657,438	C	Jan. 20, 1976
37EP	B 441,605	C	Feb. 3, 1976
37R	B 465,955	C	Feb. 3, 1976
45.8N	B 506,648	C	Feb. 3, 1976
77.5CR	B 306,668	C	Feb. 3, 1976
78.5R	B 437,209	C	Feb. 3, 1976
88.2C	B 417,014	C	Jan. 13, 1976
112.5R	B 503,817	C	Jan. 13, 1976
239A	B 349,370	C	Jan. 27, 1976
239D	B 520,256	C	Jan. 13, 1976
	B 536,935	C	Jan. 13, 1976
239.3A	B 506,148	C	Feb. 3, 1976
243C	B 516,296	C	Feb. 3, 1976
	B 526,096	C	Feb. 3, 1976
244R	B 348,433	C	Feb. 3, 1976
248NS	B 537,711	C	Jan. 13, 1976
250BC	B 491,883	C	Feb. 3, 1976
285.5	B 530,318	C	Jan. 13, 1976
293.56	B 447,000	C	Feb. 3, 1976
294.8D	B 526,510	C	Jan. 20, 1976
295.5B	B 458,617	C	Feb. 3, 1976
296R	B 477,252	C	Jan. 13, 1976
307D	B 486,280	C	Feb. 3, 1976
308A	B 488,111	C	Jan. 13, 1976
309.2	B 542,158	C	Jan. 13, 1976
326R	B 398,084	C	Feb. 3, 1976
326.5B	B 276,026	C	Feb. 3, 1976
326.9	B 477,481	C	Feb. 3, 1976
330.5	B 552,498	C	Jan. 13, 1976
343.3	B 536,675	C	Jan. 20, 1976
343.3R	B 495,550	C	Feb. 3, 1976
	B 495,554	C	Feb. 3, 1976
346.2M	B 440,858	C	Feb. 3, 1976
	B 302,160	C	Feb. 3, 1976
348.5L	B 521,324	C	Jan. 27, 1976
348.6	B 546,295	C	Jan. 20, 1976
429.7	B 464,587	C	Feb. 3, 1976
448.2H	B 390,408	C	Feb. 3, 1976
465.9	B 456,900	C	Feb. 3, 1976
471R	B 388,521	C	Jan. 13, 1976
472	B 472,256	C	Jan. 13, 1976
513R	B 494,669	C	Feb. 3, 1976
515A	B 390,031	C	Jan. 13, 1976
516	B 386,828	C	Feb. 3, 1976
534R	B 301,143	C	Jan. 27, 1976
557R	B 386,257	C	Feb. 3, 1976
593R	B 468,350	C	Jan. 13, 1976
601R	B 208,916	C	Jan. 13, 1976
609E	B 474,573	C	Jan. 20, 1976
621K	B 470,348	C	Jan. 13, 1976
647	B 394,248	C	Jan. 27, 1976
648F	B 330,736	C	Feb. 3, 1976
674SA	B 426,274	C	Jan. 20, 1976
873	B 465,688	C	Jan. 27, 1976
890	B 495,408	C	Feb. 3, 1976
942	B 386,673	C	Feb. 3, 1976
Class 261			
39A	B 562,462	C	Jan. 13, 1976
98	B 480,702	C	Jan. 27, 1976
Class 264			
36	B 308,659	C	Jan. 27, 1976
51	B 508,369	C	Jan. 13, 1976
161	B 555,437	C	Feb. 3, 1976
225	B 453,759	C	Jan. 27, 1976
Class 274			
37	B 526,388	M	Feb. 3, 1976

		CAT.	PUB. DATE
Class 280			
150.5	B 583,051	M	Feb. 3, 1976
Class 293			
71P	B 552,932	M	Feb. 3, 1976
Class 296			
35R	B 463,671	M	Jan. 13, 1976
Class 298			
35M	B 510,588	M	Jan. 27, 1976
Class 305			
27	B 506,566	M	Jan. 20, 1976
Class 307			
88.3	B 540,872	E	Jan. 20, 1976
137	B 466,444	E	Jan. 20, 1976
205	B 513,368	E	Feb. 3, 1976
232	B 540,078	E	Jan. 13, 1976
255	B 492,688	E	Jan. 20, 1976
270	B 497,960	E	Jan. 20, 1976
293	B 519,932	E	Feb. 3, 1976
296	B 512,849	E	Feb. 3, 1976
Class 310			
9.6	B 501,482	E	Jan. 13, 1976
41	B 561,784	E	Jan. 27, 1976
155	B 592,143	C	Jan. 27, 1976
Class 313			
42	B 534,443	E	Jan. 27, 1976
60	B 513,706	M	Jan. 13, 1976
99	B 518,859	E	Feb. 3, 1976
273	B 531,929	E	Jan. 20, 1976
366	B 515,455	E	Jan. 27, 1976
404	B 523,696	E	Jan. 13, 1976
452	B 160,045	E	Jan. 13, 1976
477	B 279,969	E	Jan. 13, 1976
Class 315			
169TV	B 463,322	E	Jan. 20, 1976
371	B 483,615	E	Jan. 27, 1976
388	B 516,002	E	Jan. 13, 1976
399	B 467,971	E	Jan. 13, 1976
Class 317			
9R	B 488,634	E	Jan. 20, 1976
120	B 509,606	E	Feb. 3, 1976
259	B 506,461	E	Jan. 20, 1976
Class 318			
139	B 475,236	E	Feb. 3, 1976
231	B 511,886	E	Feb. 3, 1976
257	B 502,973	E	Jan. 27, 1976
Class 321			
2	B 533,734	E	Jan. 27, 1976
7	B 509,185	E	Feb. 3, 1976
61	B 495,759	E	Feb. 3, 1976
Class 323			
1	B 430,276	E	Jan. 20, 1976
17	B 459,811	E	Jan. 20, 1976
	B 583,089	E	Jan. 27, 1976
Class 324			
13	B 079,099	E	Jan. 13, 1976
51	B 534,767	E	Feb. 3, 1976
62	B 465,393	E	Jan. 27, 1976
Class 325			
40	B 558,220	E	Jan. 27, 1976
468	B 544,961	E	Jan. 13, 1976
Class 328			
155	B 550,693	E	Jan. 20, 1976
Class 330			
33	B 439,542	E	Jan. 27, 1976
207P	B 553,460	E	Feb. 3, 1976
Class 331			
44ST	B 527,669	E	Jan. 13, 1976
51	B 538,686	E	Jan. 13, 1976
94.5C	B 549,931	E	Jan. 20, 1976
94.5L	B 506,916	E	Feb. 3, 1976
94.5P	B 394,350	E	Jan. 13, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
116R	B 527,693	E	Feb. 3, 1976
Class 333			
30R	B 453,616	E	Jan. 27, 1976
72	B 534,991	E	Jan. 27, 1976
73W	B 339,194	E	Feb. 3, 1976
Class 335			
210	B 541,517	E	Jan. 13, 1976
Class 338			
166	B 489,526	E	Feb. 3, 1976
Class 340			
172.5	B 461,336	E	Feb. 3, 1976
	B 482,907	E	Jan. 20, 1976
173R	B 545,945	M	Jan. 27, 1976
174DC	B 443,712	E	Jan. 27, 1976
174TF	B 455,425	E	Feb. 3, 1976
	B 476,681	E	Jan. 13, 1976
	B 499,718	E	Jan. 27, 1976
198	B 546,665	E	Jan. 20, 1976
347AD	B 507,647	E	Jan. 27, 1976
	B 526,106	E	Jan. 27, 1976
347CC	B 498,500	E	Jan. 20, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
100LE	B 488,395	E	Jan. 27, 1976
100LE	B 496,502	E	Jan. 20, 1976
786	B 547,994	E	Jan. 20, 1976
815	B 563,244	E	Jan. 27, 1976
Class 350			
96WG	B 381,985	M	Feb. 3, 1976
	B 537,722	M	Feb. 3, 1976
103	B 586,663	M	Feb. 3, 1976
173	B 469,947	M	Jan. 20, 1976
310	B 520,543	M	Jan. 27, 1976
320	B 548,440	M	Feb. 3, 1976
Class 354			
70	B 533,580	E	Feb. 3, 1976
298	B 489,328	E	Jan. 20, 1976
Class 355			
17	B 493,501	M	Feb. 3, 1976
Class 357			
16	B 496,487	E	Jan. 20, 1976
36	B 508,961	E	Feb. 3, 1976
65	B 470,798	E	Jan. 20, 1976
Class 358			
41	B 502,289	E	Jan. 13, 1976
Class 360			
1	B 484,365	E	Jan. 27, 1976
15	B 283,941	E	Feb. 3, 1976
17	B 461,874	E	Jan. 27, 1976
27	B 427,883	E	Jan. 20, 1976
80	B 403,477	E	Feb. 3, 1976
81	B 500,176	E	Feb. 3, 1976
85	B 501,253	E	Feb. 3, 1976
130	B 579,806	E	Feb. 3, 1976
Class 401			
219	B 557,621	M	Feb. 3, 1976
Class 403			
107	B 513,789	M	Feb. 3, 1976
318	B 540,632	M	Jan. 13, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
77	B 434,206	M	Feb. 3, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
146	B 521,986	M	Feb. 3, 1976
Class 415			
14	B 471,735	M	Feb. 3, 1976
213R	B 512,547	M	Jan. 13, 1976
214	B 552,006	M	Feb. 3, 1976
Class 416			
61	B 549,394	M	Jan. 27, 1976
Class 423			
238	B 485,401	C	Jan. 27, 1976
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
393	B 491,455	C	Feb. 3, 1976
580	B 379,177	C	Jan. 27, 1976
Class 424			
9	B 426,424	C	Feb. 3, 1976
122	B 524,179	C	Jan. 13, 1976
177	B 490,995	C	Feb. 3, 1976
203	B 576,903	C	Feb. 3, 1976
230	B 487,133	C	Jan. 27, 1976
257	B 374,588	C	Jan. 27, 1976
258	B 426,639	C	Feb. 3, 1976
263	B 466,929	C	Jan. 27, 1976
267	B 307,698	C	Feb. 3, 1976
	B 407,737	C	Feb. 3, 1976
273	B 566,464	C	Feb. 3, 1976
274	B 496,431	C	Jan. 13, 1976
311	B 457,862	C	Jan. 27, 1976
317	B 510,850	C	Feb. 3, 1976
362	B 495,489	C	Feb. 3, 1976
Class 425			
222	B 163,463	M	Jan. 27, 1976
384	B 562,813	C	Feb. 3, 1976
Class 426			
276	B 535,944	C	Jan. 13, 1976
548	B 439,778	C	Feb. 3, 1976
Class 427			
39	B 476,837	C	Jan. 20, 1976
70	B 381,709	C	Jan. 13, 1976
207	B 501,415	C	Jan. 13, 1976
343	B 160,099	C	Jan. 13, 1976
372	B 409,848	C	Jan. 27, 1976
389	B 519,377	C	Jan. 27, 1976
Class 428			
73	B 481,737	C	Jan. 13, 1976
289	B 402,929	C	Feb. 3, 1976
315	B 373,354	C	Jan. 27, 1976
434	B 457,886	C	Jan. 13, 1976
Class 431			
175	B 534,313	M	Jan. 27, 1976
264	B 398,220	M	Feb. 3, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF FEBRUARY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Plastik Pak Co., Inc.: *See—*
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Crane, Walton B., 3,935,991.

A/S Apothekernes Laboratorium for Specialpraeparater: *See—*
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A-T-O Inc.: *See—*
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Aaronson, Gerald; and Murphy, William D., to GTE Laboratories Incorporated. Scrambler and decoder for a television signal. 3,936,593, Cl. 178-5.100.

AB Printing Equipment: *See—*
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Abalikhin, Anatoly Vasilievich: *See—*
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.

Abbruzzesi, Joseph F.; *See—*
Travaglini, Michael J.; and Abbruzzesi, Joseph F., 3,936,217.

Abitibi Corporation: *See—*
Plowman, Larry M.; and Lahaye, Thomas G., 3,936,541.

Abolins, Arnold; Finckh, Hermann; Lambrecht, Dietrich; and Trabler, Martin, to Kraftwerk Union Aktiengesellschaft. Turboset including a helium turbine and a helium-cooled generator. 3,936,651, Cl. 290-1.00R.

Absher, Eugene L., to Alpha Nova Development Company. Fulcrum toy assembly. 3,935,666, Cl. 46-131.000.

ABTEC Limited: *See—*
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ACF Industries, Incorporated: *See—*
Groth, Willis G., 3,936,657.

Achter, Eugen; Hanf, Fritz; and Wiehler, Wolf, to Siemens Aktiengesellschaft. Vacuum-tight window arrangement for a rectangular-hollow conductor. 3,936,779, Cl. 333-98.00P.

Aciers et Outillage Peugeot: *See—*
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Adams, Sally L.; Cook, Michael M.; and Martin, Fred David, to Calgon Corporation. Well cementing composition having improved flow properties containing a polyamido-sulfonic additive. 3,936,408, Cl. 260-29.60S.

Adams, William H., to Pass & Seymour, Inc. Ground fault protective circuitry. 3,936,699, Cl. 317-18.00D.

AEG-Elotherm G.m.b.H.: *See—*
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Aeritalia S.p.A.: *See—*
Comollo, Virgilio, 3,935,754.

Aerojet-General Corporation: *See—*
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Agejev, G. Sz.: *See—*
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AGFA-GEVAERT N.V.: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
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Akahori, Motokazu: *See—*
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Akasaka, Hideki: *See—*
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Aker, John L.; Geist, Donald L.; Kittle, Freddie R.; and Berry, Fred M., to Kustom Electronics, Inc. Method and apparatus for digitally measuring speed. 3,936,824, Cl. 343-8.000.

Akimoto, Norio: *See—*
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Akiyama, Hiroshi: *See—*
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Akiyama, Katsuhiko, to Sony Corporation. Display structure having light emitting diodes. 3,936,694, Cl. 313-500.000.

Akiyama, Kazuhiro, to Fuji Photo Optical Co., Ltd. Independent mirror swing-up means in a single lens reflex camera with memory exposure device. 3,936,848, Cl. 354-156.000.

Akopov, Ernest Mikhailovich; Kapitanov, Nikolai Nikolaevich; Strekopytov, Alexei Alexeevich; Ogoltsova, Evgenia Sergeevna; and Paches, Alexandr Ilich. Surgical apparatus for suturing organs and tissues with metal staples. 3,935,981, Cl. 227-19.000.

Aktiebolaget Electrolux: *See—*
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Aktiebolaget Smaefa: *See—*
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Aktiebolaget Svenska Flaktfabriken: *See—*
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Saterdal, Edgar, 3,935,625.
Westergren, Folke, 3,935,898.

Aktiengesellschaft Fr. Mettler's Sohne Maschinenfabrik: *See—*
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Aktiengesellschaft Jungbunzlauer Spiritus- und Chemische Fabrik: *See—*
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Akzona Incorporated: *See—*
Miller, Eugene J., Jr.; and Tiefenthal, Harlan E., 3,936,503.
Stapp, Hans, 3,936,337.
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Albano, Philip A. Seal ring and splice enclosure. 3,936,590, Cl. 174-92.000.

Albert, Joseph J., to Martin Marietta Corporation. Secure hyperbolic guidance using noise signals and correlation detection. 3,936,827, Cl. 343-105.00R.

Albertson, Noel F., to Sterling Drug Inc. 1,2,3,4,5,6-Hexahydro-1-oxo or hydroxy-3-acyl-2,6-methano-3-benzazocines and corresponding 1-esters thereof. 3,936,462, Cl. 260-293.540.

Albright & Wilson Limited: *See—*
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Alburger, James R. Method and means for improving flaw entrapment efficiency in water-washable inspection penetrants. 3,935,731, Cl. 73-104.000.

Aldrink, Larry D.; Nielsen, Edward G.; and Vogelaar, Willard G., to Laser Alignment, Inc. Self-leveling laser assembly. 3,936,197, Cl. 356-250.000.

Alekszejev, I. A.: *See—*
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Alexander, William R. Collection receptacle. 3,936,087, Cl. 294-1.00R.

Alexeenko, Galina Nikolaevna: *See—*
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Alfredsson, Stig Allan Junior, to Sandvik Aktiebolag by change of name from Sandvikens, Jernverks Aktiebolag. Conveyor belt system. 3,936,873, Cl. 360-1.000.

Alladin Enterprises Ltd.: *See—*
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Allan, Zdenek; and Schweizer, August, to Sandoz Ltd., (Sandoz AG). Organic compounds. 3,936,496, Cl. 260-510.000.

Allegheny Ludlum Industries, Inc.: *See—*
Harltine, Albert G., III, 3,936,297.
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Allen, Douglas, Jr.; Caffrey, Richard F.; and Scanlon, J. Philip, to Johnson & Johnson. Surgical gown with transfer device. 3,935,596, Cl. 2-114.000.

Allen, George Rodger, Jr.; and McEvoy, Francis Joseph, to American Cyanamid Company. 1-Acyl-3-[2-(4-phenyl-1-piperidinyl)ethyl]indolines. 3,936,464, Cl. 260-293.610.

Allen, Harry Emitt, Sr. Portable light. 3,936,670, Cl. 240-41.300.

Allied Chemical Corporation: *See—*
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Alper, Conrad Hugh, to Damon Corporation. Treatment of pets. 3,936,527, Cl. 424-177.000.
Alpha Nova Development Company: *See—*
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Alphamedics Mfg. Corporation: *See—*
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Andresen, John H., Jr., to Intercontinental Dynamics Corporation. Radar-barometric altitude indicator. 3,936,797, Cl. 340-27.0AT.
Angelle, Philippe; and Lefevre, Georges, to Societe D'Etudes, Recherches Et Constructions Electroniques Sercel. Amplifier for analogue signal samples with automatic gain control, and circuit for digitisation of such samples. 3,936,819, Cl. 340-347.0AD.
Anselmino, Giovanni; Pozzetto, Roberto; and Carollo, Gianfranco, to Fiat Societa per Azioni. Angular velocity detector assembly for wheels of motor vehicles having anti-skid brake systems. 3,936,684, Cl. 310-168.000.
Anthony, Thomas R.; Cline, Harvey E.; and Winegar, Donald M., to General Electric Company. Solar cell. 3,936,319, Cl. 136-89.000.
Aoi Sansho Kabushiki Kaisha: *See—*
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Aono, Shigeo; and Mizuguchi, Norio, to Nissan Motor Company Limited; and Hicachi, Ltd. Ignition timing control device for automotive ignition system. 3,935,845, Cl. 123-117.00R.
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Ardry, Robert; and Robilliart, Michel, to Omnium Financier Aquitaine pour l'Hygiene et la Sante (Sanofi). Cytobiotic globulins for kidney treatment. 3,936,434, Cl. 260-112.00B.
Arendt, Henry P., to Otis Engineering Corporation. Well tubing protective fluid injection system. 3,935,903, Cl. 166-184.000.
Arimura, Iwao; Suzuki, Yasuo; Matsuda, Akira; and Sato, Akio, to Bridgestone Tire Company, Ltd. Pneumatic tired wheel. 3,935,892, Cl. 152-330.0RF.
Ariyama, Kenzo, to Ricoh Co., Ltd. Sheet stripping device for copying apparatus. 3,936,045, Cl. 271-174.000.
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Arp, Ewald A.; Arp, Robert A.; and Moody, Gene S., to Larson, Arnold W. G., a part interest. Ticket dispensing apparatus. 3,935,978, Cl. 225-15.000.
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Asberg, Sture Lennart, to SKF Industrial Trading and Development Company, B.V. Bearing with one or more flange-shaped rings. 3,936,105, Cl. 308-187.100.
Aschberger, Anton A., to Continental Can Company, Inc. Ultraviolet curing oven. 3,935,647, Cl. 34-105.000.
Asphaug, Bjorn; and Pedersen, Thor, to Elkem-Spigerverket. Control system for electrical furnaces. 3,936,588, Cl. 13-33.000.
Asplund, Herbert F.; Hess, John R.; and Kozlin, Joseph R., to United Technologies Corporation. Gas turbine construction. 3,936,222, Cl. 416-95.000.
Asplund, Ivar; and Waara, Karl Arvid Henning, to Aktiebolaget Electrolux. Vacuum cleaner and temperature-responsive motor cooling device. 3,936,282, Cl. 55-217.000.
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Auth, Gerald L., to Eocom Corporation. Multiplex interferometer. 3,936,193, Cl. 356-106.00S.
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Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, to Sandoz Ltd., (Sandoz AG). Organic compounds. 3,936,479, Cl. 260-404.000.
Avery, Michael J.; and Martino, Lawrence A., to Monsanto Company. Apparatus improvements in a rotary blow molding machine. 3,936,263, Cl. 425-296.000.
Aya, Norimoto; Takahashi, Kunihoiro; Osaka, Kenji; and Kusunose, Naohito, to Nissan Motor Co., Ltd. Vehicle door. 3,936,090, Cl. 296-146.000.
Ayer, George Edward, to Bunker Ramo Corporation. Terminal block having flat flexible interconnecting circuits. 3,936,119, Cl. 339-17.00F.
Aylott, Eric V., to Eylure Limited. Packaging of artificial eyelashes. 3,935,872, Cl. 132-88.700.
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Bakker, Gijsbertus; and van Leeuwen, Johannes Aloysius, to U.S. Philips Corporation. Color cathode ray tube frame-color selection electrode support structure. 3,936,691, Cl. 313-407.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. High temperature resistant diffusion coating. 3,936,539, Cl. 427-253.000.

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Ball, Lewis John; Smith, Gordon Roy Frank; and Fry, William Lawrence, to Rist's Wires and Cables Limited. Apparatus for use in the manufacture of a wiring harness. 3,936,344, Cl. 156-385.000.

Bals, Hans Gunter. Process and device for cutting electrically conductive material workpieces. 3,936,653, Cl. 219-68.000.

Baltimore Spice Company, The: *See—*
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Band, Ian T.; and MacLeod, Kenneth J., to Hewlett-Packard Company. Automatic gate control system. 3,936,757, Cl. 328-72.000.

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Banner, Kurt Albert. Feed device for bulk material. 3,935,952, Cl. 214-17.00D.

Bar-on, Ari, to Xerox Corporation. Metering blade for a fuser roll. 3,935,836, Cl. 118-60.000.

Barber, William Austin, to American Cyanamid Company. Copper compound catalysts for hydration of nitriles to amides. 3,936,502, Cl. 260-561.00N.

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Bareis, Alfred; Dangelmaier, Karl; and Von Wlassaty, Joachim, to L. Schuler GmbH. Punching press with tool exchanging means. 3,935,770, Cl. 83-95.000.

Barlow, Conrad R., to Transland, Inc. Jettisonable agricultural sprayer. 3,936,018, Cl. 244-136.000.

Barnes, Philip E., to United Technologies Corporation. Fan propulsor oil escapement means. 3,935,704, Cl. 60-226.00R.

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Barofsky, Douglas F., to Oregon Graduate Center for Study and Research. Activation of thin wire emitters for field ionization/field desorption mass spectrometry. 3,936,532, Cl. 427-111.000.

Barowski, Karlheinz; Schubel, Kurt; and Weinhofer, Hans, to Braun Aktiengesellschaft; and Enna-Werk Optische Anstalt. Device for moving slides vertically in projectors. 3,936,169, Cl. 353-115.000.

Barr, Harold Newton: *See—*
Goslee, David Earl; and Barr, Harold Newton, 3,936,320.

Barreto, Juan Pablo, to General Electric Company. Slinger means for humidifier. 3,936,515, Cl. 261-29.000.

Barrett, Harrison H., to Raytheon Company. Radiographic imaging system for high energy radiation. 3,936,639, Cl. 250-369.000.

Barrett, William T., to Wehr Corporation. Magnetic refuse separator. 3,935,947, Cl. 209-111.800.

BASF Aktiengesellschaft: *See—*
Maier, Karl; and Hartwig, Ernst, 3,936,477.

Baskerville, Ralph James, Jr.; and Schiro, Francis Gennaro, to Procter & Gamble Company, The. Detergent-compatible fabric softening and antistatic compositions. 3,936,537, Cl. 427-242.000.

Bassani S.p.A.: *See—*
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Bassett, Alvin Lee. Portable cutting device. 3,935,777, Cl. 83-471.300.

Batcher, Kenneth E., to Goodyear Aerospace Corporation. Solid state associative processor organization. 3,936,806, Cl. 340-172.500.

Bateman, Charles Donald, to Sundstrand Data Control, Inc. Aircraft ground proximity warning instrument. 3,936,796, Cl. 340-27.0AT.

Bauer, Hans, to Dietz-Druckguss KG. Grilling apparatus usable as a space heating means. 3,935,809, Cl. 99-447.000.

Bauman, Jack I.: *See—*
Lichowsky, Abraham; and Bauman, Jack I., 3,935,984.

Baumann, Horst: *See—*
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Bawden, Ralph D.; and Robert Olson, a/k/a John R. Olson, to Recreational Plastics, Inc. Self-propelled boat vehicle. 3,935,832, Cl. 115-.50A.

Baxter Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
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Rosenkranz, Hans-Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, 3,936,428.
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Bayerwerk Aktiengesellschaft: *See—*
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Bayne, Peter D., to Logica International Corporation. Method of cold sterilization using frozen dimethyl dicarbonate. 3,936,269, Cl. 21-58.000.

Baynes, Frederick; and Lawrie, James Munro, to Dunlop Limited. Reflector stud. 3,936,208, Cl. 404-16.000.

BBC Brown Boveri & Company Limited: *See—*
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Beacham, Harry Hoyt: *See—*
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Beall, George H.; Brydges, William T., III.; Ference, Joseph; and Kozlowski, Theodore R., to United States of America, Energy Research and Development Administration. Method for making glass-ceramic articles exhibiting high frangibility. 3,936,287, Cl. 65-30.00E.

Beaudoin, Gordon L.; Giardini, Dante S.; and Meitzler, Allen H., to Ford Motor Company. Exhaust gas sensor probe. 3,936,794, Cl. 338-34.000.

Beck, Martin. Method and apparatus for automatically harvesting and stacking sod. 3,935,904, Cl. 172-20.000.

Beckman, Paul, to United States Surgical Corporation. Clinical thermometer. 3,935,744, Cl. 73-361.000.

Becrelle, Jacques: *See—*
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Beecham Group Limited: *See—*
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Buckle, Derek Richard; and Smith, Harry, 3,936,504.

Behner, Otto; Horlein, Ulrich; Hoffmeister, Friedrich; and Schubert, Hans Werner, to Bayer Aktiengesellschaft. Benzomorphanes. 3,936,463, Cl. 260-293.540.

Behnke, Marvin C., deceased (by Behnke, Rita, legal representative), to United States of America, Navy. System to process antenna beams to obtain the angular location of target with high resolution and accuracy. 3,936,832, Cl. 343-119.000.

Behnke, Rita, legal representative: *See—*
Behnke, Marvin C., deceased, 3,936,832.

Behunin, Gage B., to Masonry Systems International, Inc. Method for prefabricating brick panels. 3,936,333, Cl. 156-60.000.

Beitzel, Stuart W., to Chromalloy American Corporation. Mixing pump and method of mixing using same. 3,936,246, Cl. 418-1.000.

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D'Annessa, Anthony Thomas; Gustin, Paul Rudolph; Smith, Donald Tolman; and Zalmans, Janis John, 3,936,128.
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Belmont Industries, Incorporated: *See—*
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Bemis Company, Inc.: *See—*
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Bendix Corporation, The: *See—*
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Benerito, Ruth R.: *See—*
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Bengert, Willis Ray. Mesh covered nested display containers. 3,935,946, Cl. 206-516.000.

Bengt Petersson New Products Investment AB: *See—*
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Benham, Hugh Michael, to ABTEC Limited. Liquid level detecting devices. 3,935,738, Cl. 73-295.000.

Benjamin, James A., to Raytheon Company. Microwave transistor package. 3,936,864, Cl. 357-74.000.

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Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,936,053.

Bennett, David W., to Grandview Industries Limited. Pipeline expansion joint having a smooth bore. 3,936,080, Cl. 285-175.000.

Bennett, Robert A. Unitary beverage container. 3,935,961, Cl. 220-266.000.

Bentley, Peter Hubert; and Clayton, John Peter, to Beecham Group Limited. Isocyanocephalosporanates. 3,936,446, Cl. 260-243.00R.

Beny, Janos: *See—*
Meggs, Daniel H.; and Beny, Janos, 3,936,110.

Berg, Karlheinz: *See—*
Unger, Klaus; and Berg, Karlheinz, 3,936,388.

Berg, Robert D. W. Coin operated locking device. 3,935,935, Cl. 194-78.000.

Berk, Charles W.: *See—*
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Berkowitz, Irving L., to Kason Hardware Corporation. Inside safety release latch device. 3,936,086, Cl. 292-341.170.

Berman, Richard M.; and Schwartz, Bernard, to Alphamedics Mfg. Corporation. Self-contained vacuum aspirator. 3,936,031, Cl. 251-284.000.

Bernz-O-Matic Corporation: *See—*
Muller-Girard, Otto; and Bray, Chester W., 3,936,814.

Berrie, Alistair Howard; and Budziarek, Richard, to Imperial Chemical Industries Limited. Water-soluble azo dyestuffs containing triazine and 3-azo-2,6-dihydroxypyrid-6-one radicals. 3,936,436, Cl. 260-153.000.

Berry, Fred M.: *See—*
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Berthold, Robert V., to Union Carbide Corporation. Preparation of unsymmetrical halogen-substituted diacyl peroxides. 3,936,506, Cl. 260-610.00D.

Besson, Andre; and Becrelle, Jacques, to Thomson-CSF. Cold cathode gas lasers. 3,936,767, Cl. 331-94.50D.

Bianchini, Pietro, to Opocrin S.r.l. Method for preparing glucoronyl-glucosamino-glycan sulphates exhibiting antilipasaemic activity. 3,936,351, Cl. 195-4.000.

Bielomatik Leuze & Co.: *See—*
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Bienati, Alberto: *See—*
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Bienfait, Charles: *See—*
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Billey, Michel, to Etablissements Zelant, Gazuit. Press notably for vulcanizing tires. 3,936,251, Cl. 425-38.000.

Billion, Leo Jozef Maria. Monitor circuit. 3,936,705, Cl. 317-136.000.

Bimet Corporation: *See—*
Peterson, James A.; and Mc Cabe, Donald A., 3,936,786.

Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich. Rotary anode for power X-ray tubes and method of making same. 3,936,689, Cl. 313-330.000.

Birkeland, Odd Thorbjorn; and Graaner, Finn. Bung with selectable flow openings. 3,935,969, Cl. 222-541.000.

Bischoff, Martin: *See—*
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Black and Decker Manufacturing Company, The: *See—*
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Moores, Robert Gordon, Jr.; and Walton, Richard Eugene, II, 3,936,100.
Schrock, Martin Omer; and Dibbern, John Earl, Jr., 3,936,242.

Blackwood, Robert S., to Fluoroware Systems Corporation. Hot plate. 3,936,660, Cl. 219-459.000.

Bladholm, Thomas A.; and McCalla, William T., to Contran Corporation. Transmission line structure. 3,935,689, Cl. 52-722.000.

Bliek, Arie. Tonneau cover for fifth wheel camper trucks. 3,936,077, Cl. 280-423.00R.

Blossfeld, Lothar, to ITT Industries, Inc. Integrated semiconductor device for scanning an image. 3,936,630, Cl. 250-211.00J.

Blum, Joseph M.; Crowder, Billy L.; and McGroddy, James C., to International Business Machines Corporation. Method of making a double heterojunction diode laser. 3,936,322, Cl. 148-1.500.

Blumenkranz, James J., to R & G Sloane Manufacturing Co., Inc. Pipe joint and method of making same. 3,936,081, Cl. 285-231.000.

Blythe, Alan Avery; and Milligan, Robert Ian, to Hawker Siddeley Aviation Limited. Combined noise shield and thrust reverser. 3,936,017, Cl. 244-110.00B.

Bobinger, Robert O.: *See—*
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Bobrick, Mitchell; Quin, Murray L.; and Buzan, Morris M., to Emerson Electric Co., by said Murray L. Quinn and Morris M. Buzan. Illumination system. 3,936,671, Cl. 240-46.590.

BOC Limited, trading as Edwards High Vacuum International: *See—*
Wycliffe, Henryk, 3,936,238.

Bock, Nils-Erik Ragnar, to Morgardshammar Aktiebolag. Roller guide. 3,935,722, Cl. 72-250.000.

Bodas, Janos: *See—*
Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Agejev, G. Sz.; and Alekszejev, I. A., 3,935,902.

Boder, Horst, to Sigri Elektrographit GmbH. Method of producing fiber-reinforced composite members. 3,936,535, Cl. 427-228.000.

Bodor, Nicolae S.; and Kaminski, James J., to Interx Research Corporation. 3-Chloro-tetrahydro-1,3-oxazines or oxazolidines spiro substituted. 3,936,466, Cl. 260-293.660.

Boehret, C. Franklin. Device for locating mass centers and other purposes. 3,935,747, Cl. 73-483.000.

Boeing Company, The: *See—*
Comollo, Virgilio, 3,935,754.

Boland, Steven H.; and Olah, Stephen, to Ultra-Violet Products, Inc. Apparatus for exposing diazo printing plates and the like. 3,936,186, Cl. 355-83.000.

Bolen, Gerhard N.; Dunbar, Sidney C.; and Smock, George E., to Owens-Corning Fiberglas Corporation. Fibrous bodies and method and apparatus for producing same. 3,936,558, Cl. 428-212.000.

Boler, Leonard J.: *See—*
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Bolgiano, Duane Ridgely, to International Mobile Machines Corporation. Code-controlled ringer attachment for telephones. 3,936,617, Cl. 179-84.00R.

Bolton-Emerson, Inc.: *See—*
Clendaniel, William Richard, 3,936,001.

Bomke, Hans A., to United States of America, Army. Secret communication system employing magnetic control of signal modulation on microwave or other electromagnetic carrier wave. 3,936,748, Cl. 325-32.000.

Bonin, Jean-Claude, to Roto Diesel. Fuel injection pumps for internal combustion engines. 3,936,233, Cl. 417-214.000.

Bonnett, Robert B. Ski equipment carrier. 3,935,977, Cl. 224-45.00S.

Boquette, Lawrence E., Jr., to Klotz, Howard S. Construction for cartridge. 3,935,816, Cl. 102-41.000.

Borel, Joseph; Lacour, Jacques; and Merckel, Gerard, to Commissariat a l'Energie Atomique. Charge-coupled device and method of fabrication of the device. 3,936,861, Cl. 357-24.000.

Borg-Warner Corporation: *See—*
Kelbel, Donald W.; and Holdeman, John W., 3,935,752.
Newton, Alwin B., 3,935,715.

Borst, Ray, to Westinghouse Electric Corporation. Nuclear reactor having thermally compensated support structure for a fuel assembly. 3,936,350, Cl. 176-87.000.

Bos, Johannes, to U.S. Philips Corporation. Stabilisation system. 3,936,716, Cl. 318-591.000.

Boske, Johann. Means to counteract a clogging of drain pipes. 3,936,380, Cl. 210-170.000.

Bosso, Joseph F.: *See—*
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Boteler, Kenneth M.; Mayfield, Cecil E.; and Harris, Vivian C., to B & W Manufacturing Company, Inc. Tubing bending machine. 3,935,721, Cl. 72-22.000.

Botta, Arthur, to Bayer Aktiengesellschaft. Production of aryl lactamhydrazones. 3,936,444, Cl. 260-239.00B.

Botzenhardt, Leonhard, to Licentia Patent-Verwaltungs-G.m.b.H. Method of producing a semiconductor arrangement. 3,935,635, Cl. 29-578.000.

Boulanger, Roger: *See—*
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Bovaird, Arthur J.: *See—*
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Boving, Egon. Rotatable cylinder lock. 3,935,720, Cl. 70-276.000.

Bowers, William S., to United States of America, Agriculture. Synthetic hormones for insect control. 3,936,474, Cl. 260-348.00A.

Bowers, William S., to United States of America, Agriculture. Synthetic hormones for insect control. 3,936,475, Cl. 260-348.00R.

Bowes, Michael A., to Kaman Aerospace Corporation. Vibration isolator. 3,936,027, Cl. 248-358.0AA.

Boyer, Wilhelm: *See—*
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Bradley, M. P. Timothy; and Shen, Jacob, to Standard Oil Company, The. Variable jet separator. 3,936,374, Cl. 210-31.00C.

Bradley, William C.; Greenleaf, Allen H.; and Lee, Roger K., Jr., to Itek Corporation. Position determining system. 3,936,632, Cl. 250-237.00R.

Brady, Donnie G., to Phillips Petroleum Company. Nonburning, nondripping, char-forming, polypropylene composition. 3,936,416, Cl. 260-42.180.

Brajituli, Peter. Ring binder. 3,936,202, Cl. 402-24.000.

Brandli, Gerold; and Keller, Pierre, to BBC Brown Boveri & Company Limited. Method for contactless measurement of conductivity and-/or temperature on metals by means of eddy currents. 3,936,734, Cl. 324-40.000.

Brandt, Robert O. Pneumatic amplifier having a gain adjustment mechanism incorporated therein. 3,936,029, Cl. 251-61.100.

Brandt, William E.; and Clark, Allen L. Body physical conditioning machine. 3,936,047, Cl. 272-57.00A.

Braun Aktiengesellschaft: *See—*
Barowski, Karlheinz; Schubel, Kurt; and Welnhofer, Hans, 3,936,169.
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Braun, Hans; and Mohn, Gerhard, to Paul Kuhbier & Co. Construction of bearing boxes. 3,936,099, Cl. 308-15.000.

Bray, Chester W.: *See—*
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Brecy, Andre Achille: *See—*
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Brenneman, Daniel Andrew; Ragan, Ramon Wright; and Brockie, Thomas Harry, to Chrysler Corporation. Mounting arrangement for electronic semi-conductor devices. 3,936,704, Cl. 317-118.000.
Bretford Manufacturing, Inc.: *See—*
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Breyfogle, Forrest Wesley, III; and Bruer, James Dudley, to International Business Machines Corporation. Spindle depress/brake mechanism. 3,936,056, Cl. 274-9.00B.
Bridgestone Tire Company, Ltd.: *See—*
Arimura, Iwao; Suzuki, Yasuo; Matsuda, Akira; and Sato, Akio, 3,935,892.
Briggs, George L. Treatment and apparatus for separation of combustion by-products from an internal combustion engine. 3,936,280, Cl. 55-3.000.
Bright, William L. Safety lock for enclosures. 3,936,083, Cl. 292-149.000.
Brill, Klaus; and Glassman, Christian, to Robert Bosch G.m.b.H. Method of selectively forming oxidized areas. 3,936,545, Cl. 427-343.000.
Bringol, Charles Ronald; Lowry, Denis Earl; and Ridings, Charles Luther, to International Business Machines Corporation. Dictation system for storing and retrieving audio information. 3,936,805, Cl. 340-172.500.
Brinkman, Earl W., to Davenport Machine Tool Division of Dover Corporation. Bearing assembly for screw machine spindle. 3,936,104, Cl. 308-151.000.
British Aircraft Corporation Limited: *See—*
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Broch, Jan, to Schulstad Brod A/S. Machine for packaging box-shaped articles in bags. 3,935,691, Cl. 53-59.00R.
Brock, Betty R., executrix: *See—*
Brock, Marlyn J., deceased, 3,936,536.
Brock, Marlyn J., deceased (by Brock, Betty R., executrix), to Firestone Tire & Rubber Company, The. Method of making rubber-coated wire. 3,936,536, Cl. 427-229.000.
Brockett, Bruce W., to NCR Corporation. Microcapsule having hydrophilic wall material and containing water soluble core material. 3,936,573, Cl. 428-402.000.
Brockie, Thomas Harry: *See—*
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Brodie, Donald E.; Camarota, Matthew; and Jankowski, Charles R. Temperature indicators. 3,935,743, Cl. 73-343.00R.
Brooke, Edric Raymond, to Xerox Corporation. Electrostatographic methods and apparatus. 3,936,171, Cl. 355-3.00R.
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Brooks, Wahner E., to United States of America, Army. Method and system for monitoring the light output of pyrotechnic luminants under dynamic conditions. 3,936,839, Cl. 346-1.000.
Brotchie, Walter J., to USM Corporation. Shoe last with insole holding devices. 3,935,609, Cl. 12-128.00D.
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Bruzzese, Tiberio; and Ferrari, Rodolfo, to SPA-Societa Prodotti Antibiotici S.p.A. Alkyl esters of polyene antibiotics. 3,936,526, Cl. 424-119.000.
Bryant, Robert G., to GEM Industries, Inc. Adjustable hanger handle for a crib frame. 3,935,603, Cl. 5-11.000.
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Buckreus, Werner, to Fritz Schwarzer, GmbH. Recording system using carbon-paper. 3,936,840, Cl. 346-32.000.
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Berrie, Alistair Howard; and Budziarek, Richard, 3,936,436.
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Bunker, Jack E. Tank fabrication process. 3,935,633, Cl. 29-559.000.
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Bunnell, Edward Dennman, to AMP Incorporated. Removable wiring device assembly. 3,935,637, Cl. 29-628.000.
Burch, Arthur Robert, to Quality Steel Fabricators, Inc. Industrial robot. 3,935,950, Cl. 214-1.0BB.
Burnett, Henry J., to Pollutant Separation, Inc. Electromagnetic induction heating apparatus. 3,936,625, Cl. 219-10.510.
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Bush, Walter R., to Stanley Works, The. Garage door radio control transmitter assembly. 3,936,833, Cl. 343-225.000.
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Butler, Jerry Allan, to Chamberlain Manufacturing Corporation. Extension ladder. 3,935,926, Cl. 182-208.000.
Butterworth, Michael Lord, to Weir Electronics Limited. Electrical power supplies. 3,936,721, Cl. 321-25.000.
Buttriss, Albert T., to Eaton Corporation. Roof nailing machine. 3,935,983, Cl. 227-110.000.
Butz, David E., to Belmont Industries, Incorporated. Paper log roller. 3,936,007, Cl. 242-67.10R.
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Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., to Armco Steel Corporation. Method of coating carbon steel. 3,936,543, Cl. 427-320.000.
Byrns, Edson H.; and Endress, James W., to Carrier Corporation. Rotary shaft tilting shoe bearing. 3,936,103, Cl. 308-73.000.
C.A.V. Limited: *See—*
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Cady, Percy L., Jr., to Houdaille Industries, Inc. Punch and stripping guide assembly. 3,935,771, Cl. 83-140.000.
Caffrey, Richard F.: *See—*
Allen, Douglas, Jr.; Caffrey, Richard F.; and Scanlon, J. Philip, 3,935,596.
Calcagno, Benedetto: *See—*
Piccolo, Luigi; Calcagno, Benedetto; Ghirga, Marcello; and Paolinelli, Antonio, 3,936,292.
Caldwell, Edward N., to Robertshaw Controls Company. Valve construction and system utilizing the same. 3,935,998, Cl. 236-1.00C.
Calgon Consumer Products Company Inc.: *See—*
Marshall, Susan Kathryn; Gerding, Thomas Graham; and King, Elmer Miller, 3,936,538.
Calgon Corporation: *See—*
Adams, Sally L.; Cook, Michael M.; and Martin, Fred David, 3,936,408.
Cam Gears Limited: *See—*
McDonald, Alexander Duncan, 3,936,101.
Camarota, Matthew: *See—*
Brodie, Donald E.; Camarota, Matthew; and Jankowski, Charles R., 3,935,743.
Cambridge Research and Development Group: *See—*
Schiffman, Murray M., 3,936,610.
Campbell, Donald L. Integrated fluidized reduction and melting of iron ores. 3,936,296, Cl. 75-26.000.
Campbell, Robert W., to Phillips Petroleum Company. Amorphous, optically clear polyamide from a bis(4-aminocyclohexyl)methane and a phenylindan dicarboxylic acid. 3,936,426, Cl. 260-78.00R.
Campbell, Stephen: *See—*
Coulter, Wallace H.; Hogg, Walter R.; Doty, Edward Neal; Longman, Millard D.; and Campbell, Stephen, 3,936,741.
Cannata, Ugo, to La Soudure Electrique Autogene, Procedes Arcos. Process and apparatus for the performance of arc welding and overlaying, preferably submerged arc. 3,936,654, Cl. 219-73.000.
Canon Kabushiki Kaisha: *See—*
Matsumura, Isao, 3,936,844.
Moriyama, Inao; Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, 3,936,177.
Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, 3,936,184.
Tanikoshi, Kinji, 3,936,710.
Cantwell, Robert Roger; and Pohl, Harold J., to Kellwood Company. Inflatable boat. 3,935,607, Cl. 9-2.00A.
Carborundum Company, The: *See—*
Marin, Glenn R., 3,936,574.

Cardone, Paul A., to Polaroid Corporation. Glucoside humectant as silver halide emulsion stabilizer. 3,936,300, Cl. 96-29.00D.
Carlson, Robert G.; and Steinhagen, Carl A., to General Electric Company. Composite metallic preform tape. 3,936,550, Cl. 428-294.000.
Carminati, Amos; and Bienati, Alberto. Method for manufacturing stockings, socks and the like. 3,935,718, Cl. 66-9.00R.
Carney, Richard William James; and de Stevens, George, to Ciba-Geigy Corporation. Hydroxyalkylenimino-phenyl-acetic acids. 3,936,467, Cl. 260-293.820.
Carollo, Gianfranco: *See—*
Anselmino, Giovanni; Pozzetto, Roberto; and Carollo, Gianfranco, 3,936,684.
Carpenter, Charles E., to Xerox Corporation. Transfer roller with stationary internal electrode. 3,936,174, Cl. 355-3.00R.
Carrier Corporation: *See—*
Byrns, Edson H.; and Endress, James W., 3,936,103.
Carter, Ivor W.: *See—*
Wright, William Paul; Shafer, Leroy; Ondocsin, John; and Carter, Ivor W., 3,935,851.
Carton, Michael L., to Wagner Electric Corporation. Clamp band retention apparatus for a parking brake chamber. 3,935,620, Cl. 24-279.000.
Case, Charles B.: *See—*
Schubert, John C.; Cyr, Steven; and Case, Charles B., 3,935,962.
Cass, David L. Edge protector device. 3,936,025, Cl. 248-345.100.
Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Schnee, Karl; Tichy, Dieter; Michel, Walter; and Gruber, Gunter, 3,936,547.
Caterpillar Tractor Co.: *See—*
Dezelan, Joseph E.; and Jessen, Henry J., 3,935,792.
Hicks, Leon E.; Peterson, Wayne A.; and Schexnayder, Lawrence F., 3,935,918.
Matthews, Ralph W., 3,935,882.
Muller, Thomas P., 3,935,921.
Stedman, Robert N., 3,935,953.
Caton, William M., to United States of America, Navy. Frequency selective optical coupler. 3,936,144, Cl. 350-96.00C.
Catrain, Michel: *See—*
Peltier, Henri; Catrain, Michel; and Monnin, Andre, 3,935,765.
Centineo, Philip, to Key II Industries. Method for collecting scale formations in water pipes. 3,936,376, Cl. 210-42.00S.
Central Research Laboratories, Inc.: *See—*
Jennrich, Carleton E., 3,936,204.
Centre Europeen de Recherches Mauvernay "C.E.R.M.": *See—*
Mauvernay, Roland Yves; Bush, Norbert; Simond, Jacques; Monteil, Andre; and Moleyre, Jacques, 3,936,450.
Century Data Systems, Inc.: *See—*
Gustafson, Kenneth Allan, 3,936,879.
Cerutti, Richard L.; and Demarest, Henry M., Jr., to PPG Industries, Inc. Novel flat glass-producing furnace. 3,936,290, Cl. 65-134.000.
CGR Medical Corporation: *See—*
Fekete, Nicholas M. G., 3,936,647.
Chamberlain Manufacturing Corporation: *See—*
Butler, Jerry Allan, 3,935,926.
Chambron, Edmond: *See—*
Lajus, Pierre; and Chambron, Edmond, 3,936,642.
Champiau, Robert Francois; and Brecy, Andre Achille, to Societe Industrielle Honeywell Bull. Control device for recording elements. 3,936,802, Cl. 340-172.500.
Charles Stark Draper Laboratory, Inc., The: *See—*
Cox, Duncan B., Jr.; and Lee, William H., 3,936,762.
Chatelain, Louis-Robert. Device for the retention of water in flower containers. 3,935,672, Cl. 47-34.00A.
Chattin, Richard Maclay: *See—*
Murray, Pierre Charles; and Chattin, Richard Maclay, 3,935,786.
Chattopadhayay, Asoke; and Habel, Georg, to Deutsche Vergaser GmbH & Co. K.G. Membrane-air pump adapted to function as a tachometer. 3,936,237, Cl. 417-311.000.
Chemetron Corporation: *See—*
Moore, Donald G., 3,936,626.
Chemicals & Phosphates, Ltd.: *See—*
Greidinger, Dahlia Simeona; and Cytter, Benedict, 3,936,501.
Chen, Nai Yuen, to Mobil Oil Corporation. Conversion of carbohydrate materials to petroleum type hydrocarbons. 3,936,353, Cl. 195-37.000.
Cheng, Shu-Sing, to Colgate-Palmolive Company. Denture cleanser. 3,936,385, Cl. 252-99.000.
Cherne Industrial, Inc.: *See—*
Desnick, Mandel L.; and Boler, Leonard J., 3,935,881.
Chery, Francois, to Aciers et Outillage Peugeot. Earth working gardening tool. 3,935,905, Cl. 172-40.000.
Chesley, Ronald F.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 3,936,053.
Chevalier, Andre: *See—*
Thiery, Jean; and Chevalier, Andre, 3,936,118.
Chicago Rawhide Manufacturing Company: *See—*
Christiansen, Keith W.; and Andersen, Kare, 3,936,257.
Chih Wu, Hsin, to Standard Oil Company, The. Process for distillation and recovery of olefinic nitriles. 3,936,360, Cl. 203-75.000.
Chikamasa, Hirohi: *See—*
Minoda, Minoru; Masuda, Haruo; Suzuki, Mitsuru; and Chikamasa, Hirohi, 3,936,306.
Childress, Kenneth A. Reagent for zinc ore and method of utilizing same. 3,936,294, Cl. 75-2.000.
Chitester, John Alvin, to Oxford Pendaflex Corporation. File cabinet drawer locking mechanism. 3,936,108, Cl. 312-217.000.
Christensen, Nils J.: *See—*
Symon, Ted; and Christensen, Nils J., 3,936,473.
Christensen, Stanley Theodore: *See—*
Perrin, Jack Louis; and Christensen, Stanley Theodore, 3,935,802.
Christiansen, Keith W.; and Andersen, Kare, to Chicago Rawhide Manufacturing Company. Closed stroke molding. 3,936,257, Cl. 425-125.000.
Christini, Theodore Peter; Eustice, Albert Lawrence; and Graham, Arthur Hughes, to Du Pont de Nemours, E. I., and Company. Method for concomitant particulate diamond deposition in electroless plating, and the product thereof. 3,936,577, Cl. 428-426.000.
Chromalloy-Alcon, Inc.: *See—*
Schultz, Ronald L., 3,936,120.
Chromalloy American Corporation: *See—*
Beitzel, Stuart W., 3,936,246.
Chrysler Corporation: *See—*
Brenneman, Daniel Andrew; Ragan, Ramon Wright; and Brockie, Thomas Harry, 3,936,704.
Durand, Remie P., 3,936,131.
Wright, William Paul; Shafer, Leroy; Ondocsin, John; and Carter, Ivor W., 3,935,851.
Chrysler, Walter R., to International Business Machines Corporation. Disc interface location. 3,936,878, Cl. 360-98.000.
Chupp, Vernon L., to Varian Associates. Optical arrangement for double-passing Ebert monochromator and for coupling double monochromator systems. 3,936,191, Cl. 356-101.000.
Chvatlinsky, Kurt: *See—*
Schmidt, Uwe; and Chvatlinsky, Kurt, 3,935,939.
Cianciolo, Joseph; and McGargal, Robert E., to Rem Die Casting, Inc. Remote control rear view mirror operating mechanism. 3,936,158, Cl. 350-289.000.
Ciba-Geigy Corporation: *See—*
Carney, Richard William James; and de Stevens, George, 3,936,467.
Green, George Edward, 3,936,366.
Rathgeb, Paul; Tournayre, Jean Claude; and Vogel, Christian, 3,936,293.
Sturm, Elmar; and Vogel, Christian, 3,936,458.
Wirth, Hermann O.; Friedrich, Hans-Helmut; and Linhart, Helmut, 3,936,422.
Ciby-Geigy Corporation: *See—*
Ramey, Chester E.; and Luzzi, John J., 3,936,456.
Citizen Watch Co., Ltd.: *See—*
Yamauchi, Masamichi; Yoshida, Makoto; and Nakayama, Yasuaki, 3,935,701.
Claassen, Volkert, to U.S. Philips Corporation. Adamantylene compounds. 3,936,491, Cl. 260-479.00R.
Clark, Allen L.: *See—*
Brandt, William E.; and Clark, Allen L., 3,936,047.
Clark, Gary T., to Eastman Kodak Company. Cationic heterocyclic-azo-heterocyclic compounds from 5-aminoimidazo-(1,2-A)pyridines. 3,936,435, Cl. 260-146.00R.
Clark, Gordon L.: *See—*
Vallese, Lucio M.; Clark, Gordon L.; and Bailey, James C., 3,936,834.
Clark, Peter Frederick, to Xerox Corporation. Corona generating device. 3,936,635, Cl. 250-325.000.
Clark, Ronald R., to Martin Marietta Corporation. Digital automatic frequency control circuit. 3,936,753, Cl. 325-420.000.
Clark, Thomas S.; and Reynolds, Hugh M., to United States of America, Navy. Transverse stiffness augmentation bearing. 3,936,058, Cl. 277-88.000.
Clary, Derwin R., to Trip Inspectors, Inc. Apparatus for supporting an inspection device for tubular members and accommodating lateral shifting of the tubular members as they are run into or pulled from a well bore. 3,936,733, Cl. 324-37.000.
Claus, Ulrich; and Dischmann, Dieter. Apparatus for pulling and replacing heat exchange tubing. 3,935,951, Cl. 214-1.00P.
Clayton, John Peter: *See—*
Bentley, Peter Hubert; and Clayton, John Peter, 3,936,446.
Clendaniel, William Richard, to Bolton-Emerson, Inc. Anti-sag device for paper mill showers. 3,936,001, Cl. 239-289.000.
Clifton, Arthur E., to Armstrong Machine Works. Light holder. 3,936,023, Cl. 248-228.000.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; Cline, Harvey E.; and Winegar, Donald M., 3,936,319.
Co, Eddy D. Cardiac catheter. 3,935,857, Cl. 128-2.050.
Coakley, Thomas A., to Owens-Corning Fiberglas Corporation. Oxidized polyolefin-high molecular weight elastomeric mixture. 3,936,415, Cl. 260-42.150.
Coaxial Scientific Corporation: *See—*
McVoy, David S., 3,936,747.
Cohan, Richard Philip. Dental instrument. 3,935,640, Cl. 32-40.00R.
Cohen, Helen. Umbrella assembly. 3,935,874, Cl. 135-16.000.
Cohen, Maurice. Position locating device for display hanger. 3,935,949, Cl. 211-168.000.
Cohen, Samuel W.; and Banko, Anton, to Surgical Design Corporation. Instruments for measuring visual fields. 3,936,164, Cl. 351-23.000.
Cole, Charles F., Jr., to Continental Oil Company. Electrical energy storage battery means. 3,936,318, Cl. 136-6.00R.
Coleman, H. Paris; Brown, Russell M.; and Wright, Billy D., to United States of America, Navy. Corrugated horn fed offset paraboloidal reflector. 3,936,837, Cl. 343-781.000.

Colgate-Palmolive Company: *See—*
Cheng, Shu-Sing, 3,936,385.
Schaar, Charles H., 3,935,768.
Weyn, Hendrik Frans, 3,935,973.
Weyn, Hendrik Frans, 3,935,974.
Weyn, Hendrik Frans, 3,935,999.
Weyn, Hendrik Frans, 3,936,000.

Collins, Robert A. Support device for lifting and supporting patients. 3,935,604, Cl. 5-90.000.

Colt Industries Operating Corporation: *See—*
McCabe, Ralph Patrick, 3,936,379.

Columbia Ribbon and Carbon Manufacturing Co., Inc.: *See—*
Newman, Douglas A., 3,936,559.

Commissariat a l'Energie Atomique: *See—*
Borel, Joseph; Lacour, Jacques; and Merckel, Gerard, 3,936,861.

Commonwealth of Australia, The: *See—*
Kossoff, George, 3,936,791.

Communications Components Corporation: *See—*
Muesse, Allen R.; and Wright, Jess C., 3,936,828.

Comollo, Virgilio, to Boeing Company, The; and Aeritalia S.p.A. Failure detector and indicator for aircraft flap actuation system. 3,935,754, Cl. 74-665.00F.

Compagnie Francaise des Petroles: *See—*
Gaudy, Claude Francois; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., 3,935,910.

Compagnie Generale de Radiologie: *See—*
Lajus, Pierre; and Chambron, Edmond, 3,936,642.

Compton, Thomas A.: *See—*
Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., 3,936,543.

Concast Incorporated: *See—*
Tegtmeier, Richard J.; Helms, Jimmy L.; and Backhaus, Karl L., 3,935,896.

Conenco International Limited: *See—*
Howlett, George H.; and Howlett, James W., 3,936,256.

Connolly, Timothy J., to Raymond Lee Organization, Inc., The, a part interest. Smokeless barbecue unit. 3,935,806, Cl. 99-340.000.

Conrad, William Arthur. Lockable tilting chair with frictional tilt resistance. 3,936,094, Cl. 297-328.000.

Consiglio Nazionale Delle Ricerche: *See—*
Papoff, Paolo; Guidarini, Dante; and Fragale, Carlo, 3,935,971.

Consupak, Inc.: *See—*
Pollock, Donald M.; and Hallowell, Fulton W., 3,936,521.

Continental Can Company, Inc.: *See—*
Aschberger, Anton A., 3,935,647.
Das, Salil K., 3,935,955.
McDevitt, James A., 3,936,265.

Continental Oil Company: *See—*
Cole, Charles F., Jr., 3,936,318.
Maxson, Orwin G., 3,935,632.

Contran Corporation: *See—*
Bladholm, Thomas A.; and McCalla, William T., 3,935,689.

Control Electronics Corporation: *See—*
Lancaster, Dean, 3,935,820.

Controls Southeast, Inc.: *See—*
Henderson, James R., 3,936,220.

Cook Electric Company: *See—*
Novak, Gary W., 3,936,785.
Splitt, Frank G.; and Frantz, William P., 3,936,133.

Cook, Martin Christopher: *See—*
Gregson, Michael; Cook, Martin Christopher; and Gregory, Gordon Ian, 3,936,443.

Cook, Michael M.: *See—*
Adams, Sally L.; Cook, Michael M.; and Martin, Fred David, 3,936,408.

Cooper, Glenn F.; and Marceau, Daniel J., to Standard Electric Time Corporation. Supervisory circuit for parallel connected devices. 3,936,821, Cl. 340-409.000.

Cooper, Jack A.; and Debruine, Carl, to Lear Siegler, Inc. Vehicle guidance mechanism. 3,935,922, Cl. 180-98.000.

Corbin, Dennis Dale: *See—*
Gabby, John Lester; Corbin, Dennis Dale; and Lowe, Jack Brufer, 3,936,391.

Corliss, Duncan S.; and Pacheco, James F., to FMC Corporation. Dishwashing compositions containing chlorinated isocyanurate. 3,936,386, Cl. 252-99.000.

Cormault, Pierre J. B.; and Megnoux, Jean M., to Electricite de France. Flame monitoring apparatus. 3,936,648, Cl. 250-554.000.

Cornell, Lew W., to Minnesota Mining and Manufacturing Company. Tamper indicator tape. 3,935,960, Cl. 220-260.000.

Cornett, Walter G., III; and Gaspar, Donald G., to Respiratory Care, Inc. Apparatus for blow molding a container with breachable sealing members. 3,936,264, Cl. 425-326.00B.

Cosentino, Louis C.: *See—*
Massie, Harold Lee; and Cosentino, Louis C., 3,935,876.

Cotton, James F., to West Point-Pepperell, Inc. Anti-dusting treatment of textiles. 3,936,561, Cl. 428-264.000.

Coulter Electronics, Inc.: *See—*
Coulter, Wallace H.; Hogg, Walter R.; Doty, Edward Neal; Longman, Millard D.; and Campbell, Stephen, 3,936,741.
Hogg, Walter R.; and Doty, Edward Neal, 3,936,666.
Hogg, Walter R., 3,936,739.
Hogg, Walter R.; and Coulter, Wallace H., 3,936,740.

Coulter Information Systems, Inc.: *See—*
Kuehnle, Manfred R., 3,936,178.

Coulter, Wallace H.; Hogg, Walter R.; Doty, Edward Neal; Longman, Millard D.; and Campbell, Stephen, to Coulter Electronics, Inc. Method and apparatus for providing primary coincidence correction during particle analysis utilizing time generation techniques. 3,936,741, Cl. 324-71.0CP.

Coulter, Wallace H.: *See—*
Hogg, Walter R.; and Coulter, Wallace H., 3,936,740.

Cox, Andrew John, to Johnson & Johnson. Methods of controlling migration of synthetic resins applied to porous materials. 3,936,542, Cl. 427-288.000.

Cox, Dennis T.; Devine, William T.; and Kelly, Gilbert J., to International Business Machines Corporation. Segmented parallel rail paths for input/output signals. 3,936,812, Cl. 340-173.00R.

Cox, Duncan B., Jr.; and Lee, William H., to Charles Stark Draper Laboratory, Inc., The. Digital phase-lock loop systems for phase processing of signals. 3,936,762, Cl. 329-104.000.

Cox, Jack R. Tobacco curing apparatus and method. 3,935,648, Cl. 34-131.000.

Cox, Richard D. Bow pulpit mounted pivoting fluke type anchor holder. 3,935,830, Cl. 114-210.000.

Craddy, Richard Adrian, to Masson Scott Thrissell Engineering Limited. Mounting devices for a blade of a rotary cutting machine. 3,935,774, Cl. 83-355.000.

Craigie, Samuel W., to M. L. Aviation Company Limited. Ejector release unit for use in aircraft. 3,936,019, Cl. 244-137.00R.

Crane Canada Limited: *See—*
Norton, Ian Fredric; and O'Grady, James, 3,936,028.

Crane Co.: *See—*
Glover, George E., 3,936,229.

Crane, Walton B., to A & E Plastik Pak Co., Inc. Plastic reinforced produce container. 3,935,990, Cl. 229-34.00R.

Crane, Walton B., to A & E Plastik Pak Co., Inc. Plastic reinforced produce container. 3,935,991, Cl. 229-34.00R.

Crase, Gary Monroe: *See—*
Tschirky, John E.; and Crase, Gary Monroe, 3,936,247.

Crawford, Thomas H.: *See—*
Kostelnicek, Richard J.; Herbert, Curtis B., Jr.; and Crawford, Thomas H., 3,936,758.

Creative Tools, Inc.: *See—*
Tudisco, Vincent J., 3,935,762.

Cromwell, John Edward; and Hyde, Glenn Francis, to Koppers Company, Inc. Bearing members having coated wear surfaces. 3,936,295, Cl. 75-0.50R.

Crotti, Renato. Apparatus for producing a coiled thread package. 3,935,622, Cl. 28-21.000.

Crowder, Billy L.: *See—*
Blum, Joseph M.; Crowder, Billy L.; and McGroddy, James C., 3,936,322.

Crucible Inc.: *See—*
Steven, Gary, 3,936,299.

Crum, James N., to Harris Corporation. Reel stand tension control system. 3,936,008, Cl. 242-75.440.

Crystal, Milton. Method of extruding foamed plastic sheathed pencils. 3,936,519, Cl. 264-46.100.

Cumming, James C., to Rockwell International Corporation. Axle assembly. 3,936,096, Cl. 303-21.0EB.

Cutler-Hammer, Inc.: *See—*
Dummer, Merlin R., 3,936,708.

Cyr, Steven: *See—*
Schubert, John C.; Cyr, Steven; and Case, Charles B., 3,935,962.

Cytter, Benedict: *See—*
Greidinger, Dahlia Simeona; and Cytter, Benedict, 3,936,501.

Daebler, Donald H., to GTE Automatic Electric Laboratories Incorporated. Apparatus for conditioning component leads. 3,935,773, Cl. 83-331.000.

Dai Nippon Toryo Kabushiki Kaisha: *See—*
Murata, Yuich, 3,936,816.

Daicel Ltd.: *See—*
Toba, Hirotaka; Ohata, Keiichi; and Tsukane, Nagayoshi, 3,936,524.

Daimler-Benz Aktiengesellschaft: *See—*
Zelenka, Hermann, 3,935,846.

Daimon, Nobutoshi; and Izawa, Toichiro. Sol of ultra-fine particles of synthetic hectorite. 3,936,383, Cl. 252-63.000.

D'Alessio, Frank P.; and Koenig, Erl A., to GPI. Safety ski binding. 3,936,064, Cl. 280-11.35K.

Dammert, Walter: *See—*
Pfitzner, Helmut; and Dammert, Walter, 3,936,445.

Damon Corporation: *See—*
Alper, Conrad Hugh, 3,936,527.

Danfoss A/S: *See—*
Larsen, Peder, 3,936,235.

Dangelmaier, Karl: *See—*
Bareis, Alfred; Dangelmaier, Karl; and Von Wlassaty, Joachim, 3,935,770.

Daniels, Dennis, to U.S. Amada, Ltd. Turret alignment apparatus. 3,935,755, Cl. 74-815.000.

Danielsen, Ole Svein, to International Standard Electric Corporation. Multimetering for telephone switching systems. 3,936,608, Cl. 179-7.10R.

D'Annessa, Anthony Thomas; Gustin, Paul Rudolph; Smith, Donald Tolman; and Zalmans, Janis John, to Bell Telephone Laboratories, Incorporated; and Western Electric Company. Solderless electrical connector for connecting a plurality of insulated wires. 3,936,128, Cl. 339-98.000.

Dart Industries Inc.: *See—*
Ihlenfeld, Russell E., 3,935,805.
Miller, Gregory H., 3,936,126.

Darvishian, Arthur. Security mailbox. 3,935,994, Cl. 232-36.000.

Das, Salil K., to Continental Can Company, Inc. Container bottom structure. 3,935,955, Cl. 215-1.00C.

Davenport Machine Tool Division of Dover Corporation: *See—*
Brinkman, Earl W., 3,936,104.

David Brown Tractors Limited: *See—*
Moorhouse, Stephen, 3,935,932.

Davis, Michael: *See—*
Gordon, Sidney, 3,936,607.

Day, Richard J.; and Yanik, LeRoy, to Midland-Ross Corporation. Compressor intake valve and control means. 3,936,236, Cl. 417-298.000.

Dean, James Clement, to United Technologies Corporation. Retractable collective pitch stick. 3,936,015, Cl. 244-83.00F.

deBough, Bjorn N. Circuit having audio output pulse rate related to measured resistance and output pulse modulation related to measured capacitance. 3,936,735, Cl. 324-57.00R.

Debruine, Carl: *See—*
Cooper, Jack A.; and Debruine, Carl, 3,935,922.

Deetken, Reinhardt R.: *See—*
Peter, Bruno E.; and Deetken, Reinhardt R., 3,935,679.

de Jong, Jan, to Fabran Holding B.V. Method for applying contrast coloured marking lines to the surface of roads. 3,936,533, Cl. 427-137.000.

De Kalb, Edward L.; and Fassel, Velmer A., to United States of America, Energy Research & Development Administration. Method of determining lanthanidies in a transition element host. 3,936,633, Cl. 250-273.000.

Demag Aktiengesellschaft: *See—*
Kaufmann, Karl Ernst, 3,935,822.

Demag Kunststofftechnik GmbH: *See—*
Fries, Bernd, 3,936,036.

Demarest, Henry M., Jr.: *See—*
Cerutti, Richard L.; and Demarest, Henry M., Jr., 3,936,290.

Demole, Edouard P., to Firmenich SA. Flavoring and perfuming ingredients. 3,936,424, Cl. 260-594.000.

Demoures, Bernard; Llauro, Daniel; and Giolito, Francois, to Rhone-Progil. Additives for improving the dispersing properties of lubricating oil. 3,936,480, Cl. 260-404.500.

Demus, Duane J.; and Von Langendorff, Vitmar G., to Houdaille Industries, Inc. Punching device having selectable pinch point clearance. 3,935,772, Cl. 83-140.000.

Denni, Raymond: *See—*
Wurmb, Rolf; Denni, Raymond; Dorst, Hans-Georg; and Ilgemann, Rudolf, 3,936,413.

Depret, Theresa G.: *See—*
Frechmann, Edmee G.; and Depret, Theresa G., 3,935,597.

Derbyshire, George Cecil, to Jacobs Manufacturing Co., Ltd., The. Hand tools. 3,935,889, Cl. 145-24.000.

De Remigis, Joseph, to Sentrol Systems Ltd. On-line system for monitoring the color, opacity and brightness of a moving web. 3,936,189, Cl. 356-73.000.

Dergazarian, Thomas E.; and Lane, George A., to Dow Chemical Company, The. Composition and method for inflation of passive restraint systems. 3,936,330, Cl. 149-35.000.

Derner, Paul; and Weigt, Paul, to Flachglas Aktiengesellschaft Delog-Detag. Multipane window structure. 3,935,683, Cl. 52-172.000.

De Ronde, Frans Christiaan, to U.S. Philips Corporation. Microstrip device having mode suppressing means. 3,936,778, Cl. 333-84.00M.

Desnick, Mandel L.; and Boler, Leonard J., to Cherne Industrial, Inc. Apparatus for steady-state volume rate flow control. 3,935,881, Cl. 137-578.000.

de Stevens, George: *See—*
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Desvignes, Francois, to U.S. Philips Corporation. Horizon sensor for a satellite in geostationary orbit. 3,936,629, Cl. 250-209.000.

Deutsche Vergaser GmbH & Co. K.G.: *See—*
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Devine, William T.: *See—*
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de Wit, Michiel; and Hotz, Roddy Fro, to Texas Instruments Incorporated. Acousto-optically Q-switched laser with modulated output. 3,936,769, Cl. 331-94.50M.

Dezelan, Joseph E.; and Jessen, Henry J., to Caterpillar Tractor Co. Pilot pump bleed control for earthmoving scrapers. 3,935,792, Cl. 91-438.000.

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Diamond Crystal Salt Company: *See—*
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Diamond Shamrock Corporation: *See—*
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Dibbern, John Earl, Jr.: *See—*
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Dickopp, Gerhard: *See—*
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Dietz-Druckguss KG: *See—*
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Dietz, Gunter, to Gebr. Happich, GmbH. Safety harness. 3,936,092, Cl. 297-385.000.

Dietz, Wolfgang Friedrich Wilhelm, to RCA Corporation. Start-up circuit for a deflection system. 3,936,115, Cl. 315-399.000.

DiGianfilippo, Dominic J.; and Nickerson, Douglas W., to Motorola, Inc. "Wild" mobile disable circuit. 3,936,616, Cl. 179-41.00A.

Di Matteo, Paul L.; Ross, Joseph A.; and Stern, Howard K. Method and apparatus for use in position determining. 3,936,649, Cl. 250-558.000.

Dingus, James C. Paper cutting machine. 3,935,776, Cl. 83-425.400.

Dingwall, Andrew Gordon Francis, to RCA Corporation. Semiconductor device including a conductor surrounded by an insulator. 3,936,859, Cl. 357-23.000.

Dischmann, Dieter: *See—*
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Disselnkotter, Hans: *See—*
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Dixi S.A.: *See—*
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Dixon, James T., to United Technologies Corporation. Blade sealing and retaining means. 3,936,216, Cl. 415-116.000.

Dochterman, Richard W., to General Electric Company. Centrifugal-vortex pump. 3,936,240, Cl. 417-368.000.

Doduco, Eugen Durrwachter: *See—*
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Doerman, Eryk Stefan, to Molins Limited. Testing of cigarettes. 3,935,728, Cl. 73-41.000.

Doerner, Frank. Method of seating a bearing. 3,935,631, Cl. 29-432.100.

Dolinski, Bolek J.: *See—*
Williams, Alverson B.; Dolinski, Bolek J.; and Pupillo, Sam S., 3,935,674.

Dolnick, Seymour S., to Glen Mfg. Inc. Cover for toilet tanks. 3,935,890, Cl. 150-52.00R.

Donoghue, John Francis, to Industrial Nucleonics Corporation. Sheet material characteristic measuring, monitoring and controlling method and apparatus using data profile generated and evaluated by computer means. 3,936,665, Cl. 235-151.300.

Donovan, John J.; and Isham, Daniel R., to R. E. Phelon Company, Inc. Spark plug connector and ignition coil module for engine ignition system. 3,935,852, Cl. 123-148.00A.

Dorman, Ira S. Refuse carrier. 3,936,068, Cl. 280-34.00B.

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Dorsey, Denis Peter; and Rodda, William E., to RCA Corporation. Video frequency amplifier operable in either of two bias conditions. 3,936,597, Cl. 178-6.800.

Dorst, Hans-Georg: *See—*
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Doucette, Eugene F., to Owens-Illinois, Inc. Apparatus for feeding shell-like articles. 3,935,967, Cl. 221-222.000.

Douglas, Bobby L., to Dresser Industries, Inc. Oil well pumpoff control system. 3,936,231, Cl. 417-12.000.

Douglas, Thomas P. Adjustable drawing sweep. 3,935,641, Cl. 33-177.000.

Dow Chemical Company, The: *See—*
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Saunders, Frank L.; and Pelletier, Ronald R., 3,936,365.

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Doyle, Donald E. Surgical nasal splint. 3,935,859, Cl. 128-89.00R.

Dozois, James H., to General Motors Corporation. Vehicle drain hole plug. 3,935,686, Cl. 52-302.000.

Drackett Company: *See—*
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Dragerwerk Aktiengesellschaft: *See—*
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Zinsmeyer, Herbert G.; Johnson, Rodney L.; and Genz, Ralph H., 3,935,741.

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Drexelbrook Controls, Inc.: *See—*
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Drori, Moshe, to C.A.V. Limited. Fuel injection pumping apparatus. 3,936,244, Cl. 417-435.000.

Druskina, Lidiya Semenovna; and Shaver, Iosif Khaimovich. Thermophosphor based on lithium fluoride. 3,936,390, Cl. 252-301.40H.

DT Liquidating Partnership: *See—*
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Dubugue Awning & Tent Company: *See—*
Frommelt, Cyril P.; and Frommelt, Sylvan J., 3,935,684.
Duffield, Peter L., to Mead Corporation, The. Catching apparatus and method for jet drop recording. 3,936,135, Cl. 346-1.000.
Duke, Marshall W.; and Gregorian, Razmic S., to United Merchants and Manufacturers, Inc. Fire retardant fabrics. 3,936,562, Cl. 428-277.000.
Dummer, Merlin R., to Cutler-Hammer, Inc. Trigger speed control switch with plastic pack semi-conductor. 3,936,708, Cl. 318-249.000.
Dumoulin, Jean; and Linguenheld, Louis, to Rhone-Poulenc S.A. Method of rendering a substrate non-stick towards tacky substances by coating the substrate with an organosilicon composition. 3,936,578, Cl. 428-429.000.
Dunbar, Frank C.: *See—*
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Dunbar, Sidney C.: *See—*
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Dunham-Bush, Inc.: *See—*
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Dunlop Limited: *See—*
Baynes, Frederick; and Lawrie, James Munro, 3,936,208.
Dunn, William C., to Semi, Inc. Sense line balancing circuit. 3,936,810, Cl. 340-173.0FF.
Du Pont de Nemours, E. I., and Company: *See—*
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Williams, John Francis; and Hayden, Mark William, 3,935,995.
Durand, Remie P., to Chrysler Corporation. Snap-in assembly and contact terminal for wedge base lamps. 3,936,131, Cl. 339-128.000.
Durkoppwerke GmbH: *See—*
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Dyczek, Maximilian: *See—*
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Dykes, Willis G.: *See—*
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Smith, David S., 3,936,854.
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Eastwood, H. Keith; Simon, Thomas R.; and Khoi, Nguyen N., to Multi-State Devices, Ltd. Temperature sensitive resistor having a critical transition temperature of about 140°C. 3,936,790, Cl. 338-25.000.
Eaton Corporation: *See—*
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Ebert, Ernst Udo, to August Ruggeberg, Firma. Method for manufacturing a file from a thin-walled tube. 3,935,756, Cl. 76-24.00R.
Edo-Aire Mitchell Industries, Inc.: *See—*
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Egger, Alfons; Widmer, Erich; Faucci, Adriano; and Gregorin, Rolf, to Lonza Ltd. Process for the production of malonic acid dinitrile. 3,936,486, Cl. 260-465.80R.
Ehlscheid, Gunter: *See—*
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Einbeck, Harro, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Housing system for gas turbines. 3,936,241, Cl. 417-407.000.
Ejiri, Masakazu; Mese, Michihiro; Yoda, Haruo; and Ikeda, Sadahiro, to Hitachi, Ltd. Pattern recognition system. 3,936,800, Cl. 340-146.3MA.
Ekman, Bror Thure Fridolf. Coupling or jointing unit. 3,936,079, Cl. 285-98.000.
Electricite de France: *See—*
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Eley, James M.; and Joyce, Arthur B., to Tyrone Hydraulics, Inc. Hydraulic pump control system. 3,935,917, Cl. 180-53.00R.
Elfgren, Carl; and Spicar, Erich, to Allmanna Svenska Elektriska Aktiebolaget. Oil-filled apparatus with means for achieving pressure between parts thereof. 3,936,784, Cl. 336-94.000.
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Ellis, Stafford Malcolm. Head-up display units and optical devices. 3,936,148, Cl. 350-173.000.
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Elmendorf, Armin; and Etzold, Roland. Flexible wood floor covering. 3,936,551, Cl. 428-50.000.
Elmgren, Kjell Ingvar: *See—*
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Ericson, Bernt Sture Jorgen, to MoDoKemi AB. Method of preparing additives for calcium sulphate plaster. 3,936,313, Cl. 106-197.00R.
Erlichman, Irving, to Polaroid Corporation. Shaft drive and control system for automatic camera. 3,936,847, Cl. 354-152.000.
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Fisher, John H. Rotary engine. 3,935,840, Cl. 123-8.230.
Fisher, Julian Vernon, to Illinois Tool Works Inc. Door handle anchor. 3,935,787, Cl. 85-80.000.
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, to Allied Chemical Corporation. Apparatus for melt-spinning synthetic fibers. 3,936,253, Cl. 425-72.00S.
Fishwick, Brian Ribbons; Greenhalgh, Colin William; and Hughes, Nigel, to Imperial Chemical Industries Limited. Monoazo compounds derived from 2-hydroxymethyl-amino benzoic acids and 2,6-dihydroxypyridines. 3,936,437, Cl. 260-156.000.
Fite, Wade L., to Extranuclear Laboratories Inc. Method and apparatus for improved focusing of ion currents in quadrupole mass filter. 3,936,634, Cl. 250-281.000.
Fitzmayer, Louis H., to General Electric Company. Microwave oven with special rack designs. 3,936,627, Cl. 219-10.55F.
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Foster, Christopher J., Sr.; and Foster, Christopher J., Jr. Method for rotation of plates to facilitate weldment. 3,935,987, Cl. 228-213.000.
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Franceschi, Peter A. Tamper-proof locking system for fire hydrants. 3,935,877, Cl. 137-296.000.
Frangiskos, Anthony Z., to Financial Mining-Industrial and Shipping Corporation. Method for beneficiation of magnesite ore. 3,936,372, Cl. 209-3.000.
Frangos, John W. Utensil basket for institutional dishwashing machines. 3,935,958, Cl. 220-19.000.
Frank Brunckhorst Co.: *See—*
Trojahn, Charles Joseph; and Friedrich, Nikolaus, 3,935,688.
Frantz, William P.: *See—*
Splitt, Frank G.; and Frantz, William P., 3,936,133.
Franz, Peter, to Buss, A.G. Process for the preparation of intermediates of polyaddition and polycondensation resins. 3,936,522, Cl. 264-141.000.
Frechmann, Edmee G.; and Depret, Theresa G. Wearing apparel hood. 3,935,597, Cl. 2-207.000.
Fredette, Victorien: *See—*
LaPointe, Jean-Rock; and Fredette, Victorien, 3,936,354.
Freedman, Raymonde; and Teale, Alfred William. Article of clothing. 3,935,608, Cl. 9-319.000.
Freeman, John Paul: *See—*
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Freze, Nikolai Ivanovich: *See—*
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.
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Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,936,053.
Fries, Bernd, to Demag Kunststofftechnik GmbH. Mixing device. 3,936,036, Cl. 259-4.00R.
Fritz Schwarzer, GmbH: *See—*
Buckreus, Werner, 3,936,840.
Fritzinger, George H. Vandal-proof street name sign. 3,935,655, Cl. 40-145.00R.
Fritzsche, Albert; and Jager, Karl, to Dornier GmbH. Casing for rotary piston engines for trochoidal construction. 3,936,248, Cl. 418-61.00B.
Frommelt, Cyril P.; and Frommelt, Sylvan J., to Dubugue Awning & Tent Company. Loading dock shelters. 3,935,684, Cl. 52-173.0DS.
Frommelt, Sylvan J.: *See—*
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Fry, William Lawrence: *See—*
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Fuji Electric Company, Ltd.: *See—*
Hirao, Kenichi, 3,936,060.

Fuji Photo Film Co., Ltd.: *See—*
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Fuji Plastic Co., Ltd.: *See—*
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Fujimura, Mikio: *See—*
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Fujisawa, Kenji: *See—*
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Fujita, Minoru, to Hitachi, Ltd. Multi-level voltage supply circuit for liquid crystal display device. 3,936,676, Cl. 307-270.000.

Fukuda, Kenji: *See—*
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Fukuda, Masaaki: *See—*
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Uchida, Kuniki; Araki, Kenzi; and Fukunaka, Shiro, 3,936,324.

Fuller, John Rodney Dyson, to Rolls-Royce (1971) Limited. Fluid systems. 3,936,218, Cl. 415-119.000.

Fulton, Theodore Alan; and Galt, John Kirtland, to Bell Telephone Laboratories, Incorporated. Supercurrent device for controlling mobile flux vortices. 3,936,677, Cl. 307-306.000.

Furuishi, Haruhisa; Murata, Yoshihiro; Suzaki, Hidenori; Sumoto, Misao; and Imanaka, Hiroshi, to Matsushita Electric Industrial Co., Ltd.; and Toyo Boseki Kabushiki Kaisha. Electrothermally deformable levelling pad. 3,936,661, Cl. 219-528.000.

Fushimi, Akihiro: *See—*
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Gaastra B.V.: *See—*
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Gaastra, Douwe, to Gaastra B.V. Grumment for sail cloth. 3,935,619, Cl. 24-141.000.

Gabby, John Lester; Corbin, Dennis Dale; and Lowe, Jack Bruner, to Drackett Company. Hydrated polyglycerol ester composition. 3,936,391, Cl. 252-356.000.

Gagliano, Louis John: *See—*
Ferrill, Richard Milledge, Jr.; and Gagliano, Louis John, 3,936,315.

Gakenholz, Werner, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Fuel pump. 3,936,243, Cl. 417-423.00R.

Galbraith, Robert E., to World Computer Corporation. Keyboard-printer terminal interface for data processing. 3,936,600, Cl. 178-17.500.

Galicia, Frank. Oil separation and recovery method. 3,936,377, Cl. 210-84.000.

Galt, John Kirtland: *See—*
Fulton, Theodore Alan; and Galt, John Kirtland, 3,936,677.

Gamble, James R., to Westinghouse Electric Corporation. Electrical bushing having a central conductor with large planar terminal portions at each end. 3,936,592, Cl. 174-153.00R.

Gamell, Joseph A., to Joseph Gamell Industries, Incorporated. Combined supercharger and carburetion system for internal combustion engine. 3,935,847, Cl. 123-119.0CF.

Gamell, Joseph A., to Joseph Gamell Industries, Incorporated. Supercharger system for internal combustion engine. 3,935,848, Cl. 123-119.0CF.

Garcia, Luis. Board game apparatus. 3,936,054, Cl. 273-134.0AD.

Garden, William David, to Imperial Chemical Industries Limited. Hardenable compositions. 3,936,581, Cl. 428-447.000.

Gardner, Ruth E., to Gaston, Marton C.; and Gaston, Joan C., part interest to each. Beauty swag lamp. 3,936,669, Cl. 240-4.200.

Garmire, Richard G.: *See—*
Main, Bertyl L.; and Garmire, Richard G., 3,935,807.

Garofalo, Donald L., to Andersen Corporation. Process for manufacturing plastic shutters and the like. 3,936,520, Cl. 264-90.000.

Garrett Corporation, The: *See—*
Scott, John W.; and Hosie, Alan P., 3,935,942.

Gary, Wardell: *See—*
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Gaspar, Donald G.: *See—*
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Gaston, Joan C.: *See—*
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Gaston, Marton C.: *See—*
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Gastonguay, James L.: *See—*
Willard, Charles F.; Marsden, Brian D.; Richardson, John G.; and Gastonguay, James L., 3,936,180.

Gates, Robert Lee, to Martin Marietta Corporation. Gas bearing reaction wheel. 3,936,682, Cl. 310-66.000.

Gaudy, Claude Francois; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., to Compagnie Francaise des Petroles. Method and apparatus for moulding protective tubing simultaneously with bore hole drilling. 3,935,910, Cl. 175-17.000.

Gaugh, Wilbur Seth; Heseltine, Donald Warren; Sturmer, David Michael; and Freeman, John Paul, to Eastman Kodak Company. Photographic emulsions containing methine dyes having a 1H-imidazo[4,5-b]pyrazine nucleus. 3,936,308, Cl. 96-136.000.

Gauntlett, John Harry. Containers. 3,935,975, Cl. 222-490.000.

Gay, Michael J., to Motorola, Inc. Motor speed control circuit. 3,936,711, Cl. 318-345.000.

Geberth, John D., Jr. Adjustable spray tip. 3,936,002, Cl. 239-455.000.

Gebr. Happich, GmbH: *See—*
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Gebruder Bellmer KG: *See—*
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Gebruder Heller, Firma: *See—*
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Geist, Donald L.: *See—*
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GEM Industries, Inc.: *See—*
Bryant, Robert G., 3,935,603.

Gemeinhardt, Paul G., to Mobay Chemical Corporation. Organic polyisocyanates. 3,936,483, Cl. 260-453.0AR.

Genbauff, Francis S., to Robertshaw Controls Company. Plural range pressure regulator construction or the like and the method of making the same or the like. 3,935,626, Cl. 29-157.10R.

General Dynamics Corporation: *See—*
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General Electric Company: *See—*
Anthony, Thomas R.; Cline, Harvey E.; and Winegar, Donald M., 3,936,319.
Barreto, Juan Pablo, 3,936,515.
Carlson, Robert G.; and Steinhagen, Carl A., 3,936,550.
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Fitzmayer, Louis H., 3,936,627.
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Kelley, Fred W., Jr., 3,936,726.
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MacKenzie, Burton Thornley, Jr.; and Wallace, Charles Frank, Jr., 3,936,572.
Parks, Harold G.; and Hughes, William C., 3,936,693.
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Rabatin, Jacob G., 3,936,644.
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Hynes, Roy G., 3,936,799.
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Mathues, Thomas P.; and Parker, Donald L., 3,935,709.
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Genz, Ralph H.: *See—*
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Gerber, Heinz Joseph; Logan, David J.; and Rich, Leonard G., to Gerber Scientific Instrument Company, The. Interactive graphic system. 3,936,712, Cl. 318-568.000.

Gerber Scientific Instrument Company, The: *See—*
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Gerding, Thomas Graham: *See—*
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Gertsch AG: *See—*
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Gewerkschaft Eisenhutte Westfalia: *See—*
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Ghirga, Marcello: *See—*
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Ghosh, Mrinal K.; and Hallof, Philip G., to McPhar Geophysics Limited. Method and means for investigating the distribution of electrical conductivity in the ground. 3,936,728, Cl. 324-6.000.

Giardini, Dante S.: *See—*
Beaudoin, Gordon L.; Giardini, Dante S.; and Meitzler, Allen H., 3,936,794.

Gibbons, David John, to EMI Limited. Radiology. 3,936,638, Cl. 250-358.00R.

Gibeault, Robert E. Method and means of combustion. 3,935,824, Cl. 110-8.00C.

Gibson, Howard Thomas, to Fothergill & Harvey Limited. Endless fibreglass belting. 3,936,338, Cl. 156-157.000.

Gilber B. Razran: *See—*
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Gillette Company, The: *See—*
Terry, John C.; Barnett, Steven V.; and Lloyd, John, 3,935,639.

Gilmore, Guy T., to Multi Fab. Inc. Portable milling tool. 3,935,788, Cl. 90-12.00R.

Giolito, Francois: *See—*
Demoures, Bernard; Llauro, Daniel; and Giolito, Francois, 3,936,480.

Giordani, Pietro. Collapsible baby stroller. 3,936,069, Cl. 280-36.00B.

Giraud, Adrien: *See—*
Gaudy, Claude Francois; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., 3,935,910.

Girling Limited: *See—*
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Givaudan Corporation: *See—*
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Glaverbel S.A.: *See—*
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Glaxo Laboratories Limited: *See—*
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Glen Mfg. Inc.: *See—*
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Glenn, Robert B., to Spaulding Fibre Company, Inc. Machining vulcanized fibre. 3,935,763, Cl. 82-1.00C.

Globe-Union Inc.: *See—*
Pukaite, Clifford Joseph, 3,936,568.

Glockner, Ehard; and Ulrich, Bodo, to Siemens Aktiengesellschaft. Rotor stack for a squirrel-cage, sliding rotor type motor. 3,936,685, Cl. 310-209.000.

Glover, George E., to Crane Co. Liquid agitator. 3,936,229, Cl. 416-178.000.

Goell, James Emanuel; and Liu, Yet-Zen, to International Telephone and Telegraph Corporation. Light-emitting diode fabrication process. 3,936,855, Cl. 357-17.000.

Goff, Raymon L., to TRW Inc. Integral power steering assembly. 3,935,790, Cl. 91-375.00A.

Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Toy vehicle target game. 3,936,053, Cl. 273-108.000.

Goldstone, Bertram J.; and Memishian, John, Jr., to Raytheon Company. Analog-to-digital converter. 3,936,820, Cl. 340-347.0AD.

Good, Elmer H., to Hollowform, Inc. Molded plastic article and method. 3,936,565, Cl. 428-315.000.

Goodwin, Roy. Face fly device. 3,935,839, Cl. 119-156.000.

Goodyear Aerospace Corporation: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
Kline, Crandall R., Jr.; and Vandale, Leonard A., 3,935,676.
Podojil, James W., 3,935,948.
Throckmorton, Morford C., 3,936,432.

Gordon, Alexander L., to Federal-Mogul Corporation. Sealing boundary gasket for compression between flanged portions of two mating metal members. 3,936,059, Cl. 277-166.000.

Gordon, Sidney, to Davis, Michael. Electronically variable audiometer of the von Bekesy type. 3,936,607, Cl. 179-1.00N.

Gorenflo, Walter C.: *See—*
Jones, Kenneth B.; and Gorenflo, Walter C., 3,936,261.

Goslee, David Earl; and Barr, Harold Newton, to Nuclear Battery Corporation. Header. 3,936,320, Cl. 136-242.000.

Gossett, Willie P.; and White, Robert F. Electrical plug ejecting apparatus. 3,936,123, Cl. 339-45.00M.

Goto, Masuo; and Isono, Akira, to Hitachi, Ltd. Field excitation control system for the synchronous generator. 3,936,722, Cl. 322-20.000.

Goto, Toshinori: *See—*
Someya, Teruo; Kobayashi, Nobuyuki; and Goto, Toshinori, 3,936,756.

Goto, Toshio, to Fuji Photo Film Co., Ltd. Photographic camera equipped with automatic film transporting mechanism. 3,936,850, Cl. 354-212.000.

Gott, Hans: *See—*
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Gould, Henry: *See—*
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Goulds Pumps, Inc.: *See—*
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Gourdeau, William F.; and Hahn, Ronald E., to Whirlpool Corporation. Door construction. 3,936,107, Cl. 312-138.00R.

GPI: *See—*
D'Alessio, Frank P.; and Koenig, Erl A., 3,936,064.

Graaner, Finn: *See—*
Birkeland, Odd Thorbjorn; and Graaner, Finn, 3,935,969.

Graf, Carl R.; Janes, Harry E.; and Slikas, Anthony W., to Pennsylvania Crusher Corporation. Material reducer. 3,936,004, Cl. 241-5.000.

Graham, Albert; and McCullough, Norman Henry, to I-T-E Circuit Breaker (Canada) Limited. Plug-in fuse receptacle interchangeable with circuit breaker. 3,936,130, Cl. 339-125.00R.

Graham, Arthur Hughes: *See—*
Christini, Theodore Peter; Eustice, Albert Lawrence; and Graham, Arthur Hughes, 3,936,577.

Granberg, Elof. Chain saw tool. 3,935,757, Cl. 76-74.000.

Grandine, Joseph D.; and Snyder, James E., to Millipore Corporation. Gel electrophoresis slide drying. 3,935,646, Cl. 34-92.000.

Grandview Industries Limited: *See—*
Bennett, David W., 3,936,080.
Ronden, Clifford Paul, 3,936,417.

Grasshoff, J. Michael; and Reid, Jerome L., to Polaroid Corporation. Novel polymeric derivatives of tetrazole-5-thiols and their metal and ammonium salts. 3,936,401, Cl. 260-8.000.

Gray, George, to Lutron Electronics Co., Inc. Dimming circuit with saturated semiconductor device. 3,936,696, Cl. 315-210.000.

Gray, Roy A., to Phillips Petroleum Company. Thermally stable, nonburning, nondripping, char forming polyolefin formulations. 3,936,420, Cl. 260-45.8NT.

Great Canadian Oil Sands Limited: *See—*
Little, James E., 3,936,358.

Grede Foundries, Inc.: *See—*
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Green, George Edward, to Ciba-Geigy Corporation. Radiation polymerisable compositions containing 3-sorboyloxy-2-hydroxypropyl groups. 3,936,366, Cl. 204-159.230.

Greenberg, Sanford D.: *See—*
Schiffman, Murray M., 3,936,610.

Greenhalgh, Colin William: *See—*
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Greenleaf, Allen H.: *See—*
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Gregorian, Razmic S.: *See—*
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Gregorin, Rolf: *See—*
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Gregory, Gordon Ian: *See—*
Gregson, Michael; Cook, Martin Christopher; and Gregory, Gordon Ian, 3,936,443.

Gregson, Michael; Cook, Martin Christopher; and Gregory, Gordon Ian, to Glaxo Laboratories Limited. Penicillin antibiotics. 3,936,443, Cl. 260-239.100.

Greidinger, Dahlia Simeona; and Cytter, Benedict, to Chemicals & Phosphates, Ltd. Process for the manufacture of crystalline urea phosphate. 3,936,501, Cl. 260-555.00R.

Greiner, Alan: *See—*
Moll, Dean H.; and Greiner, Alan, 3,935,746.

Groat, James E.; Hobson, Stanley C.; and Woolman, Lawrence B., to Anaconda Company, The. Continuous tape paying apparatus. 3,935,980, Cl. 226-43.000.

Gross, Frank C., to Scott Paper Company. Apparatus and method for holding a film on a carrier and detecting correct placement. 3,936,185, Cl. 355-73.000.

Grossman, Norman J.; and Linder, Jacques F., to Northrop Corporation. Heat conductive mounting and connection of semiconductor chips in micro-circuitry on a substrate. 3,936,866, Cl. 357-80.000.

Groth, Willis G., to ACF Industries, Incorporated. Universal positioning welding torch. 3,936,657, Cl. 219-136.000.

Groves, Karl, to VLN Corporation. Starting apparatus. 3,935,749, Cl. 74-6.000.

Gruber, Gunter: *See—*
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GTE Automatic Electric Laboratories Incorporated: *See—*
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Waldeck, Gary C., 3,936,609.

GTE Laboratories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
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Poole, Margaret A., 3,936,611.
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Guidarini, Dante: *See—*
Papoff, Paolo; Guidarini, Dante; and Fragale, Carlo, 3,935,971.

Guillemin, Ernst A., to United States of America, Army. Matched filter communication systems. 3,936,749, Cl. 325-42.000.

Gulf Research & Development Company: *See—*
Henke, Alfred M.; and McKinney, Joel D., 3,936,370.

Gulla, Michael, to Shipley Company, Inc. Pickling solution. 3,936,316, Cl. 134-3.000.

Gunther, Donald Albert, to American Sterilizer Company. Portable gas sterilizer system. 3,936,270, Cl. 21-91.000.

Guppy, John R.; and Roe, Robin D., to British Aircraft Corporation Limited. Digital communication systems. 3,936,603, Cl. 178-69.50R.

Gurevich, Samuil Mordkovich: *See—*
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.

Gustafson, Hans Hjalmar: *See—*
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Gustafson, Kenneth Allan, to Century Data Systems, Inc. Cartridge type plaint disc apparatus. 3,936,879, Cl. 360-99.000.

Gustin, Paul Rudolph: *See—*
D'Annessa, Anthony Thomas; Gustin, Paul Rudolph; Smith, Donald Tolman; and Zalmans, Janis John, 3,936,128.

Guy, Rodney J., to Western Electric Company, Inc. Molded plastic hood assembly for a cable connector plug. 3,936,129, Cl. 339-103.00R.

H. Heer & Co.: *See—*
Jung, Otto, 3,936,024.

H. J. Langen & Sons Ltd.: *See—*
Langen, Marinus J. M., 3,935,694.

Haas, Werner E. L.; and Stephany, Joseph F., to Xerox Corporation. Imaging system. 3,936,640, Cl. 250-372.000.

Habel, Georg: *See—*
Chattopadhayay, Asoke; and Habel, Georg, 3,936,237.

Haerther, Lester W.; and Kammerer, Leo P., to Rockwell International Corporation. Indicator display mechanism. 3,936,798, Cl. 340-27.0NA.

Hagelberg, Anders Torvald Sverker, to Bengt Petersson New Products Investment AB. Safety device in electrical connection devices. 3,936,122, Cl. 339-41.000.

Hahn, Ernest A., to PPG Industries, Inc. Crosslinked polyvinyl chloride film. 3,936,411, Cl. 260-32.60R.

Hahn, Ronald E.: *See—*
Gourdeau, William F.; and Hahn, Ronald E., 3,936,107.

Hall, Wilbur S., to Amchem Products, Inc. Prolonging the stability of coating baths. 3,936,546, Cl. 427-375.000.

Hallof, Philip G.: *See—*
Ghosh, Mrinal K.; and Hallof, Philip G., 3,936,728.

Hallowell, Fulton W.: *See—*
Pollock, Donald M.; and Hallowell, Fulton W., 3,936,521.

Hamada, Yasushi: *See—*
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Hamid, Michael; Krush, Emil; and Boulanger, Roger, to Alladin Enterprises Ltd. Electronic insect trap. 3,935,662, Cl. 43-112.000.

Hampel, Herbert J.; and Hoffman, William A., to Ultronic Systems Corporation. Swivel base assembly. 3,936,026, Cl. 248-349.000.

Hamstra, David C., to General Electric Company. Control circuit. 3,936,706, Cl. 317-148.50B.

Hane, Toshihide: *See—*
Sasabe, Kaoru; Kotera, Hiroaki; Hane, Toshihide; Kihara, Nobuyoshi; and Takebe, Masao, 3,936,752.

Hanf, Fritz: *See—*
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Hapgood, William H.; and Protopapas, Donald G., to Raytheon Company. Multiport high density burner. 3,936,003, Cl. 239-559.000.

Hara, Michio: *See—*
Okamoto, Michio; Izawa, Shigeru; and Hara, Michio, 3,935,645.

Hara, Yoshio: *See—*
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Harada, Toshiaki: *See—*
Nagahama, Shizuo; Shimada, Keizo; Nishikawa, Takeo; and Harada, Toshiaki, 3,936,509.

Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Battery magazine in single lens reflex camera. 3,936,846, Cl. 354-152.000.

Haraikawa, Tetsuo, to Tokico Ltd. Disc brake for use in two-wheeled vehicle. 3,935,927, Cl. 188-73.300.

Hardin, George T., to Robertshaw Controls Company. Pneumatically operated force balance transmitter and method of making the same. 3,935,875, Cl. 137-84.000.

Hardin, George T., to Robertshaw Controls Company. Force balance transmitter and parts therefor or the like. 3,936,717, Cl. 318-676.000.

Hardtmann, Goetz E., to Sandoz, Inc. 1-Substituted-2-disubstituted aminoquin azolin-4(1h)-ones. 3,936,453, Cl. 260-256.40Q.

Hargrave, Richard D.: *See—*
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Harltine, Albert G., III, to Allegheny Ludlum Industries, Inc. Method of producing austenitic stainless steel. 3,936,297, Cl. 75-130.500.

Harmsen, Ulf O.; and Pottken, Wolfgang S., to Doduco, Eugen Durrwachter. Process of producing solderable composites containing AgCdO. 3,935,988, Cl. 228-252.000.

Harner, Kermit I.; and Schneider, Roy W., to United Technologies Corporation. Control system for variable pitch fan propulsor with reverse pitch. 3,936,226, Cl. 416-28.000.

Harper, Ernest T. Combination stereo-bar. 3,936,106, Cl. 312-107.000.

Harrewijne, Arend; Michels, Albertus Peter Johannes; and Gasseling, Franciscus Wilhelmus Engelbert, to U.S. Philips Corporation. Device for converting calorific energy into mechanical energy. 3,935,708, Cl. 60-517.000.

Harrington, Timothy M., to MDH Industries, Inc. Method of measuring the duration of a discontinuous signal. 3,936,745, Cl. 324-186.000.

Harris Corporation: *See—*
Crum, James N., 3,936,008.

Harris, Glyn Islwyn; and Edwards, Alfred Gerald, to Albright & Wilson Limited. Cured aromatic resins. 3,936,510, Cl. 260-831.000.

Harris-Intertype Corporation: *See—*
Phelan, Harry Richard, 3,936,835.

Harris, Paul Anthony, to Lucas Electrical Company Limited, The. Battery charging systems for use in road vehicles. 3,936,723, Cl. 322-28.000.

Harris, Vivian C.: *See—*
Boteler, Kenneth M.; Mayfield, Cecil E.; and Harris, Vivian C., 3,935,721.

Harroff, Marlin R., to Orthopedic Equipment Company, Inc. Knee immobilizer. 3,935,858, Cl. 128-80.00C.

Hart, David R.: *See—*
Orem, Henry Philip; Hart, David R.; and Hill, Jerry E., 3,936,451.

Harte, James Richard. Multi-purpose mathematical aid. 3,935,649, Cl. 35-31.00D.

Hartenstein; Satzinger, Gerhard; and Herrmann, Manfred, to Warner-Lambert Company. Aromatic cardenolide acetals. 3,936,438, Cl. 260-210.500.

Hartwig, Ernst: *See—*
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Harvard Industries, Inc.: *See—*
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Hasegawa, Katsue: *See—*
Asakawa, Shirow; Hasegawa, Katsue; Sano, Reiji; and Matsuda, Shunsuke, 3,936,307.

Hasegawa, Tsutomu, to Kawasaki Jukogyo Kabushiki Kaisha. Insulation for double walled cryogenic storage tank. 3,935,957, Cl. 220-9.0LG.

Hauck, Frederic Peter; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Cyclohexane tetrols and derivatives thereof. 3,936,465, Cl. 260-293.650.

Hauser, Raimund: *See—*
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Hawker Siddeley Aviation Limited: *See—*
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Hawley, Jack S., to Pneumeric Corporation. Actuating mechanism. 3,935,795, Cl. 92-5.00R.

Hayashi, Masahiko; Ikeuchi, Hiroyuki; and Tanaka, Michihiko, to Toray Industries, Inc. Process of preparing polytetramethylene terephthalate. 3,936,421, Cl. 260-45.75K.

Hayashi, Motoshige: *See—*
Soda, Shigenari; and Hayashi, Motoshige, 3,936,518.

Hayashi, Yukitaka, to Hitachi, Ltd. Method of addressing magnetic memory. 3,936,875, Cl. 360-48.000.

Hayashibara Biochemical Laboratories, Incorporated: *See—*
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Hayden, Mark William: *See—*
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Hayes, John C., to Universal Oil Products Company. Hydrocarbon conversion with a sulfided catalytic composite. 3,936,369, Cl. 208-139.000.

Hayes, John C., to Universal Oil Products Company. Nonacidic multimetallic dehydrogenation catalyst. 3,936,395, Cl. 252-466.0PT.

Hazelton, Heath Robin, to Burroughs Wellcome Co. Column packing device. 3,935,884, Cl. 141-80.000.

Heckler, Clarence Herbert, Jr., to Ampex Corporation. Magnetic bubble read/write head. 3,936,883, Cl. 360-110.000.

Heeres, Jan, to Janssen Pharmaceutica N.V. 1,3-Dioxolan-2-ylmethylimidazoles. 3,936,470, Cl. 260-309.000.

Hehl, Karl. Hydraulic drive for the die closing unit of an injection molding machine. 3,935,791, Cl. 91-411.00R.

Hehl, Karl. Multi-orifice injector nozzle for injection molding machine. 3,936,262, Cl. 425-248.000.

Hehs, William A.: *See—*
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Heiba, El-Ahmadi Ibrahim: *See—*
Kinney, Robert Earl; Williams, Albert Lloyd; and Heiba, El-Ahmadi Ibrahim, 3,936,472.

Heimur, Karl, to Pennwalt Corporation. Head immobilizing device for panoramic x-ray apparatus. 3,936,641, Cl. 250-439.000.

Heine, Helmut A., to Propper Manufacturing Company, Inc.; and Optotechnik Heine KG. Ophthalmoscope illumination arrangement. 3,936,161, Cl. 351-6.000.

Heinrich Reichmann: *See—*
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Heinz Kettler Metallwarenfabrik: *See—*
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Heinz, Werner. Apparatus for measuring viscosity of liquids. 3,935,726, Cl. 73-60.000.

Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Agejev, G. Sz.; and Alekszejev, I. A., to Tyeploelektroprojekt; and Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat. Condensation apparatus for steam turbine power plants. 3,935,902, Cl. 165-110.000.

Helmintoller, Augustus M., Jr.; and Manharth, Gary B., to United States of America, Air Force. Self-supported, self-locating seal for turbine engines. 3,936,230, Cl. 416-193.00R.

Helms, Jimmy L.: *See—*
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Henderson, James R., to Controls Southeast, Inc. Jacket construction for fluid-circulating pumps. 3,936,220, Cl. 415-178.000.

Henderson, Raymond G., to A-T-O Inc. Recirculating. 3,935,719, Cl. 68-58.000.

Henke, Alfred M.; and McKinney, Joel D., to Gulf Research & Development Company. Process for producing a zeolite riser cracker feed from a residual oil. 3,936,370, Cl. 208-210.000.

Henkel & Cie G.m.b.H.: *See—*
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Hennemann, Jean, to UNELEC. Safety device with thermal and electromagnetic release for a multi-contact circuit-breaker. 3,936,780, Cl. 335-23.000.

Herbert, Curtis B., Jr.: *See—*
Kostelnicek, Richard J.; Herbert, Curtis B., Jr.; and Crawford, Thomas H., 3,936,758.

Hercules Incorporated: *See—*
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Hergoualch, Jean Rene, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Exhaust manifold for an internal combustion engine. 3,935,705, Cl. 60-302.000.

Hermann, Milton A. S. Sanitary toilet seat ring lift. 3,935,601, Cl. 4-251.000.

Herrmann, Manfred: *See—*
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Heseltine, Donald Warren: *See—*
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Hess, John R.: *See—*
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Hicachi, Ltd.: *See—*
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Hickey, Thomas L., to Rockford Servo Corporation. Web alignment apparatus for multi-level web material. 3,935,979, Cl. 226-19.000.

Hickman, Albert F.; and Moore, Robert G., to Hickman Developments, Inc. Tandem axle vehicle spring suspension. 3,936,073, Cl. 280-104.50A.

Hickman Developments, Inc.: *See—*
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Hicks, Leon E.; Peterson, Wayne A.; and Schexnayder, Lawrence F., to Caterpillar Tractor Co. Dual source hydraulic steering system. 3,935,918, Cl. 180-79.20R.

Hildebrandt, William J.; and Russell, Richard H., to Stanley Works, The. Mitre box. 3,935,779, Cl. 83-762.000.

Hilgert, Adolph J., to Johnson Service Company. Fluid compressing apparatus. 3,936,245, Cl. 417-550.000.

Hill, Bryan H. Fabrication of a semiconductor device. 3,936,860, Cl. 357-23.000.

Hill, Frank Arthur, to Ozalid Group Holdings Limited. Copying machines. 3,936,181, Cl. 355-14.000.

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Hino, Naganori: *See—*
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Hirai, Masahide; Fujimura, Mikio; Kazigase, Masahiro; and Saito, Minoru, to Unitika Ltd. Process of producing phenolic chelate resin using iminodiacetic acid. 3,936,399, Cl. 260-2.20C.

Hiraishi, Shigetoshi; Futaki, Kiyoshi; Horii, Shoichi; and Yamashita, Kiyoshi, to Mitsubishi Paper Mills, Ltd. Color photographic photosensitive material containing ultraviolet ray-absorbing compound. 3,936,305, Cl. 96-84.0UV.

Hirano, Masachika: *See—*
Satomi, Takeo; Mukai, Kunio; Mine, Akihiko; Hino, Naganori; Tateishi, Kohshi; and Hirano, Masachika, 3,936,433.

Hirao, Kenichi, to Fuji Electric Company, Ltd. Means for detecting opening degree of claws of an electrically driven machine tool chuck. 3,936,060, Cl. 279-1.00H.

Hirata, Naonori; and Matsuo, Masatoshi, to Sumitomo Chemical Company, Limited. Process for preparation of 4,4′-diaminostilbene-2,2′-disulfonic acid or salts thereof. 3,936,497, Cl. 260-510.000.

Hirayama, Eiichi: *See—*
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Hirayama, Mamoru: *See—*
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Hirschberg, Kenneth A. Method and apparatus for detecting weapon fire. 3,936,822, Cl. 340-420.000.

Hitachi Electronics Co., Ltd.: *See—*
Yanagimachi, Akio; Uehara, Takashi; Yamamoto, Tetsuo; Yamane, Hisakichi; Sawabe, Eiichi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,936,595.

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Hjortendal, Royne Gunnar; and Olsson, Jons Kurt Alvar, to Telefonaktiebolaget L M Ericsson. Control and holding circuit for relay matrices. 3,936,612, Cl. 179-18.0GE.

Hobson, Stanley C.: *See—*
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Hodne, Ingard B., to Teletype Corporation. Line feed mechanism for printer. 3,935,938, Cl. 197-114.00R.

Hodogaya Chemical Co., Ltd.: *See—*
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Hoechst Aktiengesellschaft: *See—*
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Hofer, Heinz; Scheid, Peter; and Wilwerscheid, Ernst. Injection moulding machine. 3,936,259, Cl. 425-242.00R.

Hofer, Kurt: *See—*
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Hofer, Peter H., to Union Carbide Corporation. Masking process with thermal destruction of edges of mask. 3,936,531, Cl. 427-49.000.

Hofer, Walter David. Multiposition detachable combine tooth device. 3,935,697, Cl. 56-400.000.

Hoff, Richard W., to United Technologies Corporation. Turbine vane cooling. 3,936,215, Cl. 415-11.500.

Hoff, Seymour, to Alza Corporation. Intrauterine device with restrictor for maintaining device in uterine cavity. 3,935,860, Cl. 128-130.000.

Hoffman, James W., to United States of America, Army. N Dimensional target designation vector. 3,936,826, Cl. 343-5.0SA.

Hoffman, William A.: *See—*
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Hoffmann, John A. Band saw drive arrangement. 3,935,780, Cl. 83-820.000.

Hoffmeister, Bernhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Gripping device for a lifting mechanism, especially in a core reactor for depositing and picking up fuel elements and control rods. 3,936,089, Cl. 294-86.00A.

Hoffmeister, Friedrich: *See—*
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Hofmann, John E.; and Schriesheim, Alan, to Exxon Research and Engineering Company. Process for conducting organonitrile addition reactions. 3,936,490, Cl. 260-465.300.

Hofmann, Leroy C.: *See—*
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Hogan, Gerard T., to Universal Oil Products Company. Stowable, pull-down footrest for a vehicle seat. 3,936,093, Cl. 297-425.000.

Hogan, John W., to MagTech Industries, Inc. Magnetic tape head with clamped core holders. 3,936,884, Cl. 360-125.000.

Hogg, Walter R.; and Doty, Edward Neal, to Coulter Electronics, Inc. Apparatus for measuring a particle size dividing one of the mass or particle number of a particulate system into predetermined fractions. 3,936,666, Cl. 235-151.300.

Hogg, Walter R., to Coulter Electronics, Inc. Method and apparatus for generating error corrected signals. 3,936,739, Cl. 324-71.0CP.

Hogg, Walter R.; and Coulter, Wallace H., to Coulter Electronics, Inc. Method and apparatus for automatically sampling pulses a predetermined average number of times for storage and subsequent reproduction. 3,936,740, Cl. 324-71.0CP.

Hogg, Walter R.: *See—*
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Hollowform, Inc.: *See—*
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Holmes, Jerry D.; Lowe, Benjamin L.; and Moore, Samuel D., to Texas Instruments Incorporated. SWD FM detector and IF filter. 3,936,751, Cl. 325-347.000.

Holmes, Martin E., to Westinghouse Electric Corporation. Flexible turbine missile shield. 3,936,219, Cl. 415-121.00G.

Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, to Hoechst Aktiengesellschaft. Process for the production of water adsorbing but water-insoluble cellulose ethers. 3,936,441, Cl. 260-231.00A.

Holvoet, Georges Arthur: *See—*
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Holz, Orville H., Jr.: *See—*
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Holz, Orville H., Sr.; and Holz, Norbert J., to Holz, Orville H., Jr., a part interest. Ride-type surface-working machines. 3,936,212, Cl. 404-112.000.

Honeywell Inc.: *See—*
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Horlein, Ulrich: *See—*
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Hornig, Peter K., to C.L.P. Fleck Sohne GmbH. Manufacture of veneer sheets. 3,935,888, Cl. 144-327.000.

Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Associative storage circuit. 3,936,811, Cl. 340-173.0AM.

Hornman, Johannes Petrus: *See—*
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Hornsby, James R., Jr. Tether ball apparatus with attached striking members. 3,936,050, Cl. 273-95.00A.

Hornsby, James R., Jr. Projector and dispenser activated when all targets are hit. 3,936,052, Cl. 273-101.000.

Hosie, Alan P.: *See—*
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Howlett, George H., to Howlett Machine Works. Anchor member and method of forming same. 3,935,685, Cl. 52-223.00L.

Howlett, George H.; and Howlett, James W., to Conenco International Limited. Tendon anchorage and mounting means. 3,936,256, Cl. 425-111.000.

Howlett, James W.: *See—*
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Howlett Machine Works: *See—*
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Hudson, Leslie Gordon. Fastening devices. 3,935,617, Cl. 24-81.00B.

Hughes Aircraft Company: *See—*
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Hughes, Nigel: *See—*
Fishwick, Brian Ribbons; Greenhalgh, Colin William; and Hughes, Nigel, 3,936,437.

Hughes, Philip A., to Sandoz, Inc. Rate signal generator circuit. 3,936,674, Cl. 307-233.00R.

Hughes, William C.: *See—*
Parks, Harold G.; and Hughes, William C., 3,936,693.

Huignard, Jean Pierre; and Spitz, Erich, to Thomson-CSF. Holographic memory providing both angular and translational reference beam deflections. 3,936,139, Cl. 350-3.500.

Hully, Donald R. Scholastic test and grading apparatus. 3,935,650, Cl. 35-48.00B.

Hunkar, Denes B., to Hunkar Laboratories, Inc. Machine control circuit. 3,936,713, Cl. 318-573.000.

Hunkar Laboratories, Inc.: *See—*
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Hutchinson, Ronald G., to Simmons Company. Mattress foundation. 3,935,605, Cl. 5-351.000.

Hutter, Harold Gregory, to Bunker Ramo Corporation. Electrical connector with metal to metal seal. 3,936,125, Cl. 339-94.00C.

Hutter, Harold Gregory, to Bunker Ramo Corporation. Coaxial electrical connector. 3,936,132, Cl. 339-130.00C.

Hutton, Ronald P.: *See—*
Oude Alink, Bernardus A.; and Hutton, Ronald P., 3,936,279.

Hyde, Glenn Francis: *See—*
Cromwell, John Edward; and Hyde, Glenn Francis, 3,936,295.

Hynes, Roy G., to General Motors Corporation. Automotive vehicle rotary display and warning device. 3,936,799, Cl. 340-52.00F.

I-T-E Circuit Breaker (Canada) Limited: *See—*
Graham, Albert; and McCullough, Norman Henry, 3,936,130.

Ichinose, Akira; and Karube, Norio, to Matsushita Electric Industrial Co., Ltd. Molecular gas laser device with an improved output mirror means. 3,936,768, Cl. 331-94.50C.

Igawa, Masayuki: *See—*
Tabara, Yoshijiro; Akiyama, Hiroshi; Igawa, Masayuki; Maekawa, Tadashi; and Shinomiya, Tokuo, 3,936,512.

Ihlenfeld, Russell E., to Dart Industries Inc. Spreader closure. 3,935,805, Cl. 99-300.000.

Iida, Makoto; and Kuroda, Akira, to Toshiba Seiki Kabushiki Kaisha; and Kanebo Kabushiki Kaisha. Doffing apparatus for spinning frame. 3,935,699, Cl. 57-52.000.

Iida, Yoshio: *See—*
Masuyama, Takeshi; Matsuura, Mikio; Iida, Yoshio; and Amemiya, Toshioki, 3,936,396.

Ikeda, Hideo; and Akasaka, Hideki, to Nippon Kogaku K.K. Multilayer anti-reflection film for ultraviolet rays. 3,936,136, Cl. 350-1.000.

Ikeda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Lens selection device. 3,936,150, Cl. 350-183.000.

Ikeda, Sadahiro: *See—*
Ejiri, Masakazu; Mese, Michihiro; Yoda, Haruo; and Ikeda, Sadahiro, 3,936,800.

Ikeda, Yoshihiko, to Kokusan Denki Co., Ltd. Automatic voltage regulator for a separately excited generator. 3,936,724, Cl. 322-28.000.

Ikeuchi, Hiroyuki: *See—*
Hayashi, Masahiko; Ikeuchi, Hiroyuki; and Tanaka, Michihiko, 3,936,421.

Ikuta, Michinobu: *See—*
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Fisher, Julian Vernon, 3,935,787.
Murray, Pierre Charles; and Chattin, Richard Maclay, 3,935,786.

Imai, Toshihiro, to Olympus Optical Co., Ltd. Non-homogeneous objective lens having an aperture diaphragm. 3,936,149, Cl. 350-175.0GN.

Imamura, Kazuyoshi: *See—*
Kusunose, Tetsuhiro; Ishikawa, Tatsuo; Akimoto, Norio; Fukuma, Noboru; and Imamura, Kazuyoshi, 3,936,394.

Imanaka, Hiroshi: *See—*
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Berrie, Alistair Howard; and Budziarek, Richard, 3,936,436.
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Institut Francais du Petrole: *See—*
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International Mobile Machines Corporation: *See—*
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Inuiya, Masafumi, to Fuji Photo Film Co., Ltd. Optical projection apparatus. 3,936,596, Cl. 178-6.000.
Irick, Gether, Jr.: *See—*
Wang, Richard H. S.; and Irick, Gether, Jr., 3,936,419.
Irie, Osamu, to Sony Corporation. FM receiver having transmitting function. 3,936,746, Cl. 325-20.000.
Isaichenko, Veronika Vasilievna: *See—*
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.
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Ishizuka, Takashi; and Miwa, Naoki, to Nitto Electric Industrial Co., Ltd. Aqueous baking varnishes from carboxylic polyester and carboxylic polyimide, and coated article. 3,936,404, Cl. 260-29.20N.
Isono, Akira: *See—*
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Itoh, Kunio; and Yoshida, Takeo, to Shinetsu Chemical Company. Silicone compositions containing platinum-containing material and manganese carbonate. 3,936,476, Cl. 260-37.0SB.
ITT Industries, Inc.: *See—*
Blossfeld, Lothar, 3,936,630.
Putschky, Ernst, 3,936,030.
Stjernstrom, Bo Gustaf, 3,936,225.
Iversen, Arthur H., to Radiologic Sciences, Inc. Cellularized Luminescent structures. 3,936,645, Cl. 250-486.000.
Iwata, Torayoshi, to Nissha Printing Co., Ltd. Transfer material. 3,936,570, Cl. 428-349.000.
Izawa, Shigeru: *See—*
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Izawa, Toichiro: *See—*
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Izumida, Yukihiro; Koizumi, Kihachiro; and Miyata, Yoshihiko, to Hitachi, Ltd. Electron gun assembly for use in multi-beam type cathode ray tube. 3,936,692, Cl. 313-414.000.
J. E. Love Company: *See—*
Neal, Archie E.; and Moore, Paul, 3,935,906.
Jackson, Andrew W. Kite construction. 3,936,020, Cl. 244-153.00R.
Jacobs Manufacturing Co., Ltd., The: *See—*
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Jakway, William M.; and Kollmansberger, Ronald B., to McDonnell Douglas Corporation. Aluminum alloy-boron fiber composite. 3,936,277, Cl. 29-191.600.
James, Ian, to Foseco International Limited. Hot dip galvanising. 3,936,540, Cl. 427-310.000.
Janes, Harry E.: *See—*
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Janin, Pierre R., to Analytab Products Inc. Profile recognition method and apparatus for identifying bacteria. 3,936,356, Cl. 195-103.50R.
Janiszewski, Kasimir. Guiding means for boring bar. 3,935,764, Cl. 82-1.200.
Jankowski, Charles R.: *See—*
Brodie, Donald E.; Camarota, Matthew; and Jankowski, Charles R., 3,935,743.
Janssen Pharmaceutica N.V.: *See—*
Heeres, Jan, 3,936,470.
Jefferies, Fitch B., Sr., to C.M.S. Inc. Corrosion monitoring system. 3,936,737, Cl. 324-65.0CR.
Jelliffe, Robin Stewart. Maternity protection device. 3,936,075, Cl. 280-150.00B.
Jennrich, Carleton E., to Central Research Laboratories, Inc. Tape clamp. 3,936,204, Cl. 403-209.000.
Jensen, Garold K.; and McGeogh, James E., to United States of America, Navy. Plural channel filter. 3,936,761, Cl. 328-167.000.
Jensen, Garold K.; and McGeogh, James E., to United States of America, Navy. Combined contiguous filter and acceleration and velocity analyzer for radar. 3,936,825, Cl. 343-9.000.
Jessen, Henry J.: *See—*
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Jidosha Kiki Co., Ltd.: *See—*
Yanagawa, Itiro; and Suzuki, Isao, 3,936,097.
Jirka, Howard F., to Zenith Radio Corporation. Automatic color level circuit with peak detector. 3,936,869, Cl. 358-27.000.
Johnson, Eldon E. Livestock mineral dispenser. 3,935,838, Cl. 119-54.000.
Johnson & Johnson: *See—*
Allen, Douglas, Jr.; Caffrey, Richard F.; and Scanlon, J. Philip, 3,935,596.
Cox, Andrew John, 3,936,542.
Johnson, Peter B.; and Brown, Edward A., to United States of America, Army. Combined fuze and guidance system for a missile. 3,935,818, Cl. 102-70.20P.
Johnson, Raymond Arthur, to U.M.C. Industries, Inc. Coin-dispensing device. 3,935,873, Cl. 133-5.00R.
Johnson, Rodney L.: *See—*
Zinsmeyer, Herbert G.; Johnson, Rodney L.; and Genz, Ralph H., 3,935,741.
Johnson Service Company: *See—*
Hilgert, Adolph J., 3,936,245.
Jolly, Steven E. Integrated thermal energy control system using a heat pump. 3,935,899, Cl. 165-29.000.
Jonell, Per Olof; and Elmgren, Kjell Ingvar. Pore water pressure measuring device. 3,935,745, Cl. 73-398.00R.
Jones, Gerald N., to United States of America, Navy. Single pulse TOA measurement system. 3,936,831, Cl. 343-113.00R.
Jones, Kenneth B.; and Gorenflo, Walter C., to Vistron Corporation. Apparatus for manufacturing brushes. 3,936,261, Cl. 425-245.00R.
Jones, Robert N., to Xerox Corporation. Internally shielded transfer roller. 3,936,175, Cl. 355-3.0TR.
Jonker, Roelof R. Collimator kit. 3,936,646, Cl. 250-509.000.
Joseph Gamell Industries, Incorporated: *See—*
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Gamell, Joseph A., 3,935,848.
Joseph Lucas (Industries) Limited: *See—*
Smith, Trevor Stanley, 3,935,703.
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Jung, Otto, to H. Heer & Co. Supporting-frame structures. 3,936,024, Cl. 248-243.000.
Junkel, Wolfgang O.; and Kneipper, Jeffrey M., to American Hospital Supply Corporation. Dental handpiece wrench. 3,935,761, Cl. 81-55.000.
Jurd, Leonard; King, A. Douglas, Jr.; and Stanley, William L., to United States of America, Agriculture. Antimicrobial agents and use thereof. 3,936,393, Cl. 252-404.000.

Kaasenbrood, Petrus J. C.; and Verstegen, Johannes D. M., to Unie Van Kunstmestfabrieken, B.V. Process for preparing urea. 3,936,500, Cl. 260-555.00A.

Kabbe, Hans-Joachim: *See*—
Petersen, Uwe; Kabbe, Hans-Joachim; and Petersen, Siegfried, 3,936,447.

Kabil, Adel J., to Aktiengesellschaft Jungbunzlauer Spiritus- und Chemische Fabrik. Process for the production of citric acid. 3,936,352, Cl. 195-36.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Kabushiki Kaisha Meidensha: *See*—
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Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kuwako, Tomohisa; Tanase, Toshio; and Sasase, Naoshi, 3,936,680.

Kabushiki Kaisha Tokyo Keikio: *See*—
Kawada, Shin-ichi; and Hojo, Takeshi, 3,935,644.

Kale, Howard D. Traps for sinks, laundry tubs and the like. 3,935,602, Cl. 4-292.000.

Kallis, James M., to Hughes Aircraft Company. Subsonic flow aerodynamic window for high energy laser. 3,936,771, Cl. 331-94.50C.

Kaman Aerospace Corporation: *See*—
Bowes, Michael A., 3,936,027.

Kaminski, James J.: *See*—
Bodor, Nicolae S.; and Kaminski, James J., 3,936,466.

Kaminsky, Daniel, to Warner-Lambert Company. Polycyclic dioxaborin complexes. 3,936,488, Cl. 260-462.00R.

Kaminsky, Daniel, to Warner-Lambert Company. Hydroxymethylene-substituted chromone-3-carboxaldehydes, process for their preparation and intermediates produced thereby. 3,936,563, Cl. 424-283.000.

Kammerer, Leo P.: *See*—
Haerther, Lester W.; and Kammerer, Leo P., 3,936,798.

Kanebo Kabushiki Kaisha: *See*—
Iida, Makoto; and Kuroda, Akira, 3,935,699.

Kaneko, Katsuyoshi, to Maruwa Echo Co., Ltd. Detachable luggage caster roller unit. 3,935,613, Cl. 16-30.000.

Kaneko, Yasuhisa: *See*—
Niimi, Itaru; Kaneko, Yasuhisa; Komiyama, Yoshiro; Tokui, Masaaki; Kondo, Katsumi; and Kouno, Akio, 3,935,797.

Kansai Paint Company, Ltd.: *See*—
Watanabe, Tadashi; and Maruyama, Tsutomu, 3,936,368.

Kantor, Paul: *See*—
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Kapany, Narinder S., to Kaptron, Inc. High efficiency light transmitting window panel. 3,936,157, Cl. 350-258.000.

Kapitanov, Nikolai Nikolaevich: *See*—
Akopov, Ernest Mikhailovich; Kapitanov, Nikolai Nikolaevich; Strekopytov, Alexei Alexeevich; Ogoltsova, Evgenia Sergeevna; and Paches, Alexandr Ilich, 3,935,981.

Kaplan, Arnold. Knocked-down trunk. 3,935,931, Cl. 190-19.000.

Kappel, Friedrich. Device for use with drills or the like for the collection of working debris. 3,936,213, Cl. 408-67.000.

Kaptron, Inc.: *See*—
Kapany, Narinder S., 3,936,157.

Karl Leibfried GmbH: *See*—
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Karls, Robert F.; and Enright, James H., to Emerson Electric Co. Compactor. 3,935,812, Cl. 100-214.000.

Karmas, George, to Ortho Pharmaceutical Corporation. Diarylmethylenes. 3,936,493, Cl. 260-488.0CD.

Karube, Norio: *See*—
Ichinose, Akira; and Karube, Norio, 3,936,768.

Kason Hardware Corporation: *See*—
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Kasuga, Masao: *See*—
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Kasugai, Tsuneo; Minagawa, Nobuhiko; Hamada, Yasushi; Sugahara, Yujiro; and Naito, Hiroyuki. Article having a whitened polyolefin surface. 3,936,304, Cl. 117-33.50T.

Katayama, Shigenari: *See*—
Yamamoto, Hisao; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; and Katayama, Shigenari, 3,936,468.

Katkov, Robert B.: *See*—
Wagner, Herbert A.; and Katkov, Robert B., 3,935,913.

Kato, Hideo; and Koshinaka, Eiichi, to Hokuriku Pharmaceutical Co., Ltd. 1′,4′-Dihydro-1-methyl-spiro [piperidine and pyrrolidine-2,3′(2′H)quinoline]-2′-one compounds. 3,936,459, Cl. 260-288.0CE.

Kato, Hideo; and Koshinaka, Eiichi, to Hokuriku Pharmaceutical Co., Ltd. 1′,4′-Dihydro-1-methyl-spiro[piperidine and pyrolidine-2,3′(2′H)quinoline] compounds. 3,936,460, Cl. 260-288.0CE.

Kato, Yoshinori: *See*—
Kogure, Osamu; Takada, Hisao; Kato, Yoshinori; and Kawachi, Masao, 3,936,815.

Katoh, Hirokazu; and Endo, Akinori, to Nippon Gakki Seizo Kabushiki Kaisha. Voice presetting system in electronic musical instruments. 3,935,781, Cl. 84-1.110.

Katz, Martin, to Syntex Corporation. Analgesic formulations having enhanced therapeutic activity. 3,936,528, Cl. 424-260.000.

Katzman, James A.; and Yoshioka, Yoshiro, to Amdahl Corporation. Data processing system having a common channel unit with circulating fields. 3,936,803, Cl. 340-172.500.

Kaufmann, Karl Ernst, to Demag Aktiengesellschaft. Monorail trolley. 3,935,822, Cl. 104-93.000.

Kawachi, Masao: *See*—
Kogure, Osamu; Takada, Hisao; Kato, Yoshinori; and Kawachi, Masao, 3,936,815.

Kawada, Mitsuo. Rotary strainer. 3,936,378, Cl. 210-107.000.

Kawada, Shin-ichi; and Hojo, Takeshi, to Kabushiki Kaisha Tokyo Keikio. Gyrocompass. 3,935,644, Cl. 33-324.000.

Kawamura, Takahide; Yoshino, Muneki; and Taniguchi, Koichi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic seat belt locking system for vehicle. 3,935,919, Cl. 180-82.00C.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Hasegawa, Tsutomu, 3,935,957.

Kawazoe, Katsuyoshi: *See*—
Marumoto, Ryuji; Yoshioka, Yoshio; Honjo, Mikio; and Kawazoe, Katsuyoshi, 3,936,439.

Kay, Edward Leo, to Firestone Tire & Rubber Company, The. Rubber laminates. 3,936,576, Cl. 428-424.000.

Kayano, Tatsuo: *See*—
Yanagimachi, Akio; Uehara, Takashi; Yamamoto, Tetsuo; Yamane, Hisakichi; Sawabe, Eiichi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,936,595.

Kazeva, Richard, to Allegheny Ludlum Industries, Inc. Method for producing ferritic stainless steel having high anisotropy. 3,936,323, Cl. 148-12.0EA.

Kazigase, Masahiro: *See*—
Hirai, Masahide; Fujimura, Mikio; Kazigase, Masahiro; and Saito, Minoru, 3,936,399.

Keck, Jurgen, to Gebruder Bellmer KG. Adjustable belt conveyor. 3,935,941, Cl. 198-139.000.

Keegan, James J.; Patel, Girish; and Rubin, Howard, to Warner-Lambert Company. Anhydrous products having improved wettability characteristics, case 5. 3,936,402, Cl. 260-17.00R.

Keegan, William P. Pipettes. 3,935,734, Cl. 73-425.600.

Keijser, Karl Olov, to AB Printing Equipment. Inking apparatus for printing press. 3,935,815, Cl. 101-349.000.

Keiser, LeRoy H., to Phillips Petroleum Company. Differential release coated articles. 3,936,582, Cl. 428-447.000.

Kelbel, Donald W.; and Holdeman, John W., to Borg-Warner Corporation. Transmission. 3,935,752, Cl. 74-473.00R.

Keller, Pierre: *See*—
Brandli, Gerold; and Keller, Pierre, 3,936,734.

Kelley, Fred W., Jr., to General Electric Company. Gating control for a static switching arrangement with improved dynamic response. 3,936,726, Cl. 323-24.000.

Kelley, Fred W., Jr.; and Lezan, Georges R. E., to General Electric Company. High speed control of reactive power for voltage stabilization in electric power systems. 3,936,727, Cl. 323-102.000.

Kellwood Company: *See*—
Cantwell, Robert Roger; and Pohl, Harold J., 3,935,607.

Kelly, Gilbert J.: *See*—
Cox, Dennis T.; Devine, William T.; and Kelly, Gilbert J., 3,936,812.

Kelly, John F.; and Rizzo, Frank. Auto door lock alarm. 3,936,673, Cl. 307-10.0AT.

Kelsey-Hayes Company: *See*—
Every, Peter, 3,936,095.

Kempf, Richard Alan: *See*—
Mellon, Donald Williams; and Kempf, Richard Alan, 3,936,774.

Kendall Company, The: *See*—
Samour, Carlos M.; and Richards, Mildred C., 3,936,492.

Kendall, Don L.: *See*—
Matzen, Walter T.; and Kendall, Don L., 3,936,789.

Kendall, Don Leslie; and Knowles, John C., Jr., to Texas Instruments Incorporated. Integral honeycomb-like support of very thin single crystal slices. 3,936,329, Cl. 148-187.000.

Kenney, William J.; and Fleischmann, Lester K., to Standard Manifold Company. Hanger and sheet lifter for ring binder. 3,936,201, Cl. 402-4.000.

Kern, Cecil, to Lawrence Peska Associates, Inc., a part interest. Collapsible wig stand. 3,935,871, Cl. 132-54.000.

Kersten, Ralf, to Siemens Aktiengesellschaft. Coupling arrangements between light conductive fibers and between light conductive fibers and terminal equipment. 3,936,142, Cl. 350-96.00C.

Key II Industries: *See*—
Centineo, Philip, 3,936,376.

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Khetchikov, Lev Nikolaevich: *See*—
Balitsky, Vladimir Sergeevich; Khetchikov, Lev Nikolaevich; Orlova, Valentina Petrovna; and Balitskaya, Ljudmila Vasilievna, 3,936,276.

Khoi, Nguyen N.: *See*—
Eastwood, H. Keith; Simon, Thomas R.; and Khoi, Nguyen N., 3,936,790.

Kidd, Wayne L.; Tsilibes, George N.; and Urciuoli, Stephen C., to Xerox Corporation. Optical system. 3,936,173, Cl. 355-3.00R.

Kihara, Nobuyoshi: *See*—
Sasabe, Kaoru; Kotera, Hiroaki; Hane, Toshihide; Kihara, Nobuyoshi; and Takebe, Masao, 3,936,752.

Kim, Dong Wha: *See—*
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 3,936,253.

Kimio Shibayama: *See—*
Shibayama, Kimio; and Yamanouchi, Kazuhiko, 3,936,679.

Kine, Masayoshi, to Shimano Industrial Company, Limited. Fluid pressure braking system for a bicycle. 3,935,930, Cl. 188-344.000.

King, A. Douglas, Jr.: *See—*
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King, Elmer Miller: *See—*
Marshall, Susan Kathryn; Gerding, Thomas Graham; and King, Elmer Miller, 3,936,538.

King, Henry L.; and McGee, John W., to Monsanto Company. Bis glycol ester of sodium sulfo isophthalic acid from its dimethyl ester. 3,936,389, Cl. 252-182.000.

King, Jack B., to General Motors Corporation. Vapor regulating valve. 3,935,850, Cl. 123-136.000.

Kinney, Robert Earl; Williams, Albert Lloyd; and Heiba, El-Ahmadi Ibrahim, to Mobil Oil Corporation. Lactone acid synthesis. 3,936,472, Cl. 260-343.600.

Kirchhoff, Kurt, to Heinrich Reichmann. Three-element projection lenses. 3,936,155, Cl. 350-226.000.

Kirst, Paul-Gerhard; Maier, Karl; and Winkler, Heinz, to Wacker-Chemie GmbH. Coating material for buildings. 3,936,311, Cl. 106-90.000.

Kittle, Freddie R.: *See—*
Aker, John L.; Geist, Donald L.; Kittle, Freddie R.; and Berry, Fred M., 3,936,824.

Kleeberg, Wolfgang; Wiedenmann, Rudolf; and Ahne, Helmut, to Siemens Aktiengesellschaft. Method for the manufacture of elongated material particularly electric cable and wire. 3,936,523, Cl. 264-211.000.

Klein, Bradley R. Mass transportation. 3,935,819, Cl. 104-23.0FS.

Klein, William H. Beach blanket staking device. 3,935,653, Cl. 40-125.00H.

Kleinbohl, Helmut, to General Motors Corporation. Counter mechanism for continuous measurements, particularly distance measurements. 3,935,996, Cl. 235-95.00R.

Kliger, Herbert L. Surgical sponge. 3,935,863, Cl. 128-296.000.

Kline, Crandall R., Jr.; and Vandale, Leonard A., to Goodyear Tire & Rubber Company, The. Tire tread grinding. 3,935,676, Cl. 51-106.00R.

Klotz, Howard S.: *See—*
Boquette, Lawrence E., Jr., 3,935,816.

Kneipper, Jeffrey M.: *See—*
Junkel, Wolfgang O.; and Kneipper, Jeffrey M., 3,935,761.

Knize, Elmer J., to Lippy Can Co., Ltd. Cap locking member. 3,935,963, Cl. 220-315.000.

Knoche, Wilhelm; and Wiese, Gottfried, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Pressure jump relaxation measurement apparatus. 3,935,727, Cl. 73-37.000.

Knowles, John C., Jr.: *See—*
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Knutti, Helmut: *See—*
Aurin, Friedrich; Kantor, Paul; Knutti, Helmut; and Weinheimer, Hans-Richard, 3,936,152.

Kobayashi, Hisamine, to Shikishima Tipton Mfg. Co., Ltd. Method for vibratory finishing workpieces under heavily compressed condition. 3,935,680, Cl. 51-313.000.

Kobayashi, Nobuyuki: *See—*
Someya, Teruo; Kobayashi, Nobuyuki; and Goto, Toshinori, 3,936,756.

Kobayashi, Shohei: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Koiwa, Yoichi; Miike, Akira; Nomura, Tatsuo; and Kobayashi, Shohei, 3,936,469.

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Koenig, Erl A.: *See—*
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Koepke, Donald Bernard, to Warwick Electronics Inc. Double touch key for musical instruments. 3,935,784, Cl. 84-435.000.

Kogure, Osamu; Takada, Hisao; Kato, Yoshinori; and Kawachi, Masao, to Nippon Telegraph and Telephone Public Corporation. Apparatus and method for writing storable images into a matrix-addressed image-storing liquid crystal display device. 3,936,815, Cl. 340-324.00M.

Kohashi, Makoto: *See—*
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Kohler Coating Machinery Corporation, The: *See—*
Kohler, John B.; and Brookes, Ronald R., 3,936,549.

Kohler, John B.; and Brookes, Ronald R., to Kohler Coating Machinery Corporation, The. Method and apparatus for applying a liquid coating to strip material. 3,936,549, Cl. 427-428.000.

Kohmura, Isao; Futaki, Kiyoshi; and Tahara, Yukio, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording composition and sheet. 3,936,309, Cl. 106-21.000.

Koiwa, Kenji; and Kohashi, Makoto. Horn unit for a speaker. 3,935,925, Cl. 181-192.000.

Koiwa, Yoichi: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Koiwa, Yoichi; Miike, Akira; Nomura, Tatsuo; and Kobayashi, Shohei, 3,936,469.

Koizumi, Kihachiro: *See—*
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Komiyama, Yoshiro: *See—*
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Kondo, Katsumi: *See—*
Niimi, Itaru; Kaneko, Yasuhisa; Komiyama, Yoshiro; Tokui, Masaaki; Kondo, Katsumi; and Kouno, Akio, 3,935,797.

Konicek, Jiri K., to Perstorp AB. Method for the production of material for printed circuits and material for printed circuits. 3,936,548, Cl. 427-405.000.

Konig, Hans-Bodo; Schrock, Wilfried; Disselnkotter, Hans; and Metzer, Karl Georg, to Bayer Aktiengesellschaft. Unreidoacetamido-penicilins. 3,936,442, Cl. 260-239.100.

Konig, Joachim; and Suling, Carlhans, to Bayer Aktiengesellschaft. Process for the production of acrylonitrile-vinyl chloride copolymers. 3,936,511, Cl. 260-881.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
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Koppers Company, Inc.: *See—*
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Korte, Siegfried: *See—*
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Korver, Klaas, to Northern Electric Company Limited. Full duplex data transmission system using two speeds of diphase signal for simplified sync. 3,936,602, Cl. 178-58.00R.

Koshinaka, Eiichi: *See—*
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Kato, Hideo; and Koshinaka, Eiichi, 3,936,460.

Kossoff, George, to Commonwealth of Australia, The. Linear array ultrasonic transducer. 3,936,791, Cl. 340-1.00R.

Kostelnicek, Richard J.; Herbert, Curtis B., Jr.; and Crawford, Thomas H., to Exxon Production Research Company. Phase difference detector. 3,936,758, Cl. 328-133.000.

Kostrzewa, Michael: *See—*
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Kotcharian, Michel: *See—*
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Kotera, Hiroaki: *See—*
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Kouno, Akio: *See—*
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Krage, Colonel F., to Dickinson, Russell B. Method for texturing a concrete surface. 3,936,209, Cl. 404-75.000.

Krakau, Carl Erik Torsten; and Ohman, Rolf Gunnar. Night vision testing method and apparatus. 3,936,162, Cl. 351-17.000.

Kramer, William E., to Xerox Corporation. Adjustable sheet guide. 3,936,044, Cl. 271-122.000.

Kraskin, Kenneth S., to Personal Products Company. Inhibition of conditions arising from microbial production of ammonia. 3,935,862, Cl. 128-287.000.

Krause, Dieter, to Siemens Aktiengesellschaft. Apparatus for measuring electrical quantities at high-voltage potential. 3,936,742, Cl. 324-96.000.

Kriebitz, Helmut; Ploetz, Theodor; and Westerhuis, Popko Julius, to Feldmuehle Aktiengesellschaft. Process for the manufacture of flat-shaped articles. 3,936,544, Cl. 427-335.000.

Krings, Peter: *See—*
Lehmann, Hans-Jurgen; Bischoff, Martin; Baumann, Horst; and Krings, Peter, 3,936,317.

Krupp, Carroll P.; and Stevenson, Hildreth W., to B. F. Goodrich Company, The. Nonmetallic composite friction member. 3,936,552, Cl. 428-64.000.

Krush, Emil: *See—*
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Kubodera, Seiiti: *See—*
Shiba, Keisuke; Kubodera, Seiiti; Naito, Hideki; and Hirose, Takeshi, 3,936,303.

Kuehnle, Manfred R., to Coulter Information Systems, Inc. Apparatus for large scale screen display of images. 3,936,178, Cl. 355-5.000.

Kugelmann, Friedrich: *See—*
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Kulesza, Chester P.: *See—*
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Kulite Semiconductor Products, Inc.: *See—*
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Kumada, Akio; Takano, Hiroshi; Eto, Yoshizumi; and Hibi, Masao, to Hitachi, Ltd. Irregular ferroelectric element for controllable single domain. 3,936,146, Cl. 350-149.000.

Kunst, Helmut: *See*—
Fichtl, Walter; Wiebke, Gunter; Kunst, Helmut; von Matuschka, Alfred Graf; Bachmann, Georg; and Lipp, Alfred, 3,936,327.

Kupplungstechnik GmbH: *See*—
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Kurei, Hiroshi; Urano, Fumio; and Nomura, Katsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with optionally operable manual controls. 3,936,843, Cl. 354-51.000.

Kurganov, Georgy Vladimirovich: *See*—
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.

Kurmeier, Hans, to Sudoldenburger Tierfrischmehl-Anlagengesellschaft. Method and apparatus for deodorizing waste gases. 3,936,281, Cl. 55-71.000.

Kuroda, Akira: *See*—
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Kuroiwa, Katumasa: *See*—
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Kurt Manufacturing Company, Inc.: *See*—
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Kurtz, Anthony D.; and Mallon, Joseph R., to Kulite Semiconductor Products, Inc. Methods of fabricating integrated transducer assemblies. 3,935,634, Cl. 29-577.000.

Kusama, Masahiko: *See*—*
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Kushida, Hideo; Hara, Yoshio; Tanaka, Toshie; Itakura, Takeshi; and Nakazato, Shinsaku, to Yoshino Kogyosho Co., Ltd. Collapsable tube. 3,936,334, Cl. 156-69.000.

Kustom Electronics, Inc.: *See*—
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Kusunose, Naohito: *See*—
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Kusunose, Tetsuhiro; Ishikawa, Tatsuo; Akimoto, Norio; Fukuma, Noboru; and Imamura, Kazuyoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Polymer adsorbents and method for manufacture thereof. 3,936,394, Cl. 252-430.000.

Kuwako, Tomohisa; Tanase, Toshio; and Sasase, Naoshi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Miniature self-starting electric motor. 3,936,680, Cl. 310-40.0MM.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Fujimoto, Yasuo; Tatsukawa, Keizo; Koiwa, Yoichi; Miike, Akira; Nomura, Tatsuo; and Kobayashi, Shohei, 3,936,469.

L. Schuler GmbH: *See*—
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Finsterwalder, Kurt; Philipp, Karl-Heinz; Veil, Martin; Widmann, Karl; and Zwerina, Karl, 3,935,724.

La Soudure Electrique Autogene, Procedes Arcos: *See*—
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Lacour, Jacques: *See*—
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Lagana, Vincenzo: *See*—
Zardi, Umberto; Lagana, Vincenzo; and Mantegazza, Carlo, 3,936,499.

Lagergren, Hans. Endocardial electrode. 3,935,864, Cl. 128-418.000.

Lahaye, Thomas G.: *See*—
Plowman, Larry M.; and Lahaye, Thomas G., 3,936,541.

Lajus, Pierre; and Chambron, Edmond, to Compagnie Generale de Radiologie. X-ray film-handling arrangement for x-ray diagnostic apparatus. 3,936,642, Cl. 250-469.000.

Lake, Charles G., to Intercole Automation, Inc. Calender. 3,936,258, Cl. 425-135.000.

Lamberti, Vincent, to Lever Brothers Company. α-Amino-β-sulfosuccinates. 3,936,448, Cl. 260-247.10E.

Lambrecht, Dietrich: *See*—
Abolins, Arnold; Finckh, Hermann; Lambrecht, Dietrich; and Trabler, Martin, 3,936,651.

Lancaster, Dean, to Control Electronics Corporation. Apparatus for the identification of moving units. 3,935,820, Cl. 104-88.000.

Landis Tool Company: *See*—
Price, Ralph E., 3,935,675.

Lane, Charles E., III, to Honeywell Inc. Adjustable mounting arrangement for recording head. 3,936,882, Cl. 360-104.000.

Lane, George A.: *See*—
Dergazarian, Thomas E.; and Lane, George A., 3,936,330.

Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Machine for forming wrap-around shipper packages. 3,935,694, Cl. 53-389.000.

Lannen, Robert J., to Micropoise Engineering Company. Universally tiltable balancing machine for inflated pneumatic tires. 3,935,748, Cl. 73-484.000.

Lanning, Robert L., to United States Steel Corporation. Removal of sulfur dioxide from stack gases with phosphate slimes. 3,936,525, Cl. 423-242.000.

Lantz, Claude C., to Forex Neptune S.A. Anchoring system for a floating offshore drilling vessel. 3,935,829, Cl. 114-206.00R.

LaPointe, Jean-Rock; and Fredette, Victorien. Anti-tumour product of bacterial origin. 3,936,354, Cl. 195-79.000.

Larralde, Edward, to Vetco Offshore Industries, Inc. Balanced hoist apparatus. 3,936,034, Cl. 254-188.000.

Larsen, Peder, to Danfoss A/S. Fuel oil supply means. 3,936,235, Cl. 417-279.000.

Larson, Arnold W. G.: *See*—
Arp, Ewald A.; Arp, Robert A.; and Moody, Gene S., 3,935,978.

Lasco Corporation: *See*—
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Laser Alignment, Inc.: *See*—
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Lask, Helmut: *See*—
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Lathom, Paul R., to Rockford Headed Products, Inc. Thread swaging screw. 3,935,785, Cl. 85-46.000.

Lattari, Pasquale R.; and Redfield, Carl, to Texas Instruments Incorporated. Solid state bonding process employing the isothermal solidification of a liquid interface. 3,935,986, Cl. 228-115.000.

Lawrence Peska Associates, Inc.: *See*—
Kern, Cecil, 3,935,871.

Lawrie, James Munro: *See*—
Baynes, Frederick; and Lawrie, James Munro, 3,936,208.

Lawson, John W., to University of California, The Regents of the. Microorganism growth media and the stabilization thereof. 3,936,355, Cl. 195-100.000.

Lea, James M.; and Burroughs, John D. Method of packaging and unpackaging a self-inflating air mattress. 3,935,690, Cl. 53-24.000.

Lear Siegler, Inc.: *See*—
Cooper, Jack A.; and Debruine, Carl, 3,935,922.

Leblanc, Destin A.: *See*—
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Leblanc, Robert Bruce; and Leblanc, Destin A., to Leblanc, Robert Bruce. Fire retarding textile materials. 3,936,585, Cl. 428-921.000.

Leco Corporation: *See*—
Sitek, George J.; Revesz, Robert N.; and Berk, Charles W., 3,936,587.
Swiatlowski, Gerald G., 3,935,677.

Lee, Bock W., to Badger Meter, Inc. Ultrasonic flow meter. 3,935,735, Cl. 73-194.00A.

Lee, Kuang-Chang. Centrifugal stepless speed changing device. 3,935,751, Cl. 74-230.180.

Lee, Roger K., Jr.: *See*—
Bradley, William C.; Greenleaf, Allen H.; and Lee, Roger K., Jr., 3,936,632.

Lee, William H.: *See*—
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Lefevre, Georges: *See*—
Angelle, Philippe; and Lefevre, Georges, 3,936,819.

Lehle, Robert, to Karl Leibfried GmbH. Device for smooth pressing shrink foil wrappings. 3,935,693, Cl. 53-184.00R.

Lehmann, Hans-Jurgen; Bischoff, Martin; Baumann, Horst; and Krings, Peter, to Henkel & Cie G.m.b.H. Dishwashing compositions containing higher 1,2-alkanediol ether monosulfates. 3,936,317, Cl. 134-29.000.

Leibowitz, Martin N. Flying toy. 3,935,663, Cl. 46-60.000.

Leifheit International Gunter Leifheit KG: *See*—
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Leinberger, Gerhard Karl. Jumper cables for sparkling polarity indicator. 3,936,121, Cl. 339-29.00B.

Lenz, John O.; and Wolfe, Ingo E., to Kurt Manufacturing Company, Inc. Bolster table device for punch press. 3,935,811, Cl. 100-53.000.

Leonard, James H., Jr., to Allied Industries, Inc. Vented gravity blender. 3,936,037, Cl. 259-180.000.

Lesnik, Jack Vender, to Rohm and Haas Company. Yarn combining method and device. 3,935,698, Cl. 57-18.000.

Lever Brothers Company: *See*—
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Leverenz, Melvin E.; and Vanderscors, Robert L., to Diamond Crystal Salt Company. Salt dissolver construction. 3,936,274, Cl. 23-270.00R.

Levine, Steven K. Power system. 3,936,652, Cl. 290-2.000.

Levy, Sidney; and Friedman, Abraham. Thermoelectric display device. 3,936,817, Cl. 340-336.000.

Lewis, Meirion Francis; and Maines, James Dennis, to National Research Development Corporation. Surface acoustic wave oscillators. 3,936,765, Cl. 331-1.00R.

Lezan, Georges R. E.: *See*—
Kelley, Fred W., Jr.; and Lezan, Georges R. E., 3,936,727.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
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Lichowsky, Abraham; and Bauman, Jack I., to Ambitex Company; and Medical Monitors, Inc., part interest to each. Automatic cuff mechanism for blood pressure measuring system. 3,935,984, Cl. 128-2.05C.

Liebe, Wolfgang, to Siemens Aktiengesellschaft. Cooling arrangement for electric generators of underwater power plants. 3,936,681, Cl. 310-54.000.

Lieder, Gaylerd; and Rawlins, Philip G., to Bemis Company, Inc. Flap pull down case stripping apparatus. 3,936,043, Cl. 271-14.000.

Ligorati, Ferdinando; Nova, Vittorio Emanuele; and Aglietti, Giancarlo, to Societa' Italiana Resine S.p.A. Process for the production of 2,2-(4,4'-dihydroxy-diphenyl)propane. 3,936,507, Cl. 260-619.00A.
Lincoln Center for the Performing Arts, Inc.: *See*—
Schubin, Mark; and Andersen, George, 3,936,594.
Lindeberg, Sven-Erik, to Telefonaktiebolaget L M Ericsson. Selecting device for crossbar switches. 3,936,781, Cl. 335-112.000.
Lindell, John F.: *See*—
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Linder, Jacques F.: *See*—
Grossman, Norman J.; and Linder, Jacques F., 3,936,866.
Lindestrom, Lars-Erik E.; and Wibring, Arne S., to Aktiebolaget Svenska Flaktfabriken. Device for reduction of disturbing noise in a flow control device. 3,935,880, Cl. 137-499.000.
Linguenheld, Louis: *See*—
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Linhart, Helmut: *See*—
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Link, Reinhold G., to Linkspiel, Inc. Ski clamp. 3,936,067, Cl. 280-11.37A.
Linkspiel, Inc.: *See*—
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Lipkins, Morton S. Method and device for assembling hollow retroreflectors. 3,936,194, Cl. 356-153.000.
Lipowski, Stanley A., to Diamond Shamrock Corporation. Naphthenohydroxamic acid preparation. 3,936,494, Cl. 260-500.50H.
Lipp, Alfred: *See*—
Fichtl, Walter; Wiebke, Gunter; Kunst, Helmut; von Matuschka, Alfred Graf; Bachmann, Georg; and Lipp, Alfred, 3,936,327.
Lippy Can Co., Ltd.: *See*—
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Liquidometer Corporation: *See*—
Ells, Edward G., 3,935,739.
List, Ralph W.; and Stanley, Robert K., to Textured Yarn Co., Inc. Strand winding. 3,936,006, Cl. 242-18.00A.
Litman, Alan, to Smith & Wesson Chemical Company, Inc. Illuminated reticle projection system. 3,936,137, Cl. 350-10.000.
Little, James E., to Great Canadian Oil Sands Limited. Method of controlling the feed rate of quench water to a coking drum in response to the internal pressure therein. 3,936,358, Cl. 201-39.000.
Liu, Yet-Zen: *See*—
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Livingstone, Stanley. Collapsible dye tube. 3,936,009, Cl. 242-118.110.
Llauro, Daniel: *See*—
Demoures, Bernard; Llauro, Daniel; and Giolito, Francois, 3,936,480.
Lloyd, Geoffrey Oliver; Rhoades-Brown, John Ernest; and Saunders, Stuart Richard John, to Secretary of State for Trade & Industry in Her Britannic Majesty's Govt. of U.K. of Gt. Britain & Northern Ireland. Prevention of corrosion in metals. 3,936,583, Cl. 428-450.000.
Lloyd, John: *See*—
Terry, John C.; Barnett, Steven V.; and Lloyd, John, 3,935,639.
Lloyd, William W., to Texas Instruments Incorporated. Crystal growth combining float zone technique with the water cooled RF container method. 3,936,346, Cl. 156-620.000.
Lobanoff, Valenteen S., to Goulds Pumps, Inc. Vertical cantilever pump. 3,936,221, Cl. 415-200.000.
Locher, Lorenz. Brush for the care and cleaning of things and the body. 3,935,611, Cl. 15-160.000.
Lock, James A.; Hofmann, Leroy C.; and Kulesza, Chester P., to International Paper Company. In-line process for the production of corrugated board. 3,936,339, Cl. 156-205.000.
Lockheed Aircraft Corporation: *See*—
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Loftin, Wayne M., to Raymond Lee Organization, Inc., The, a part interest. Shoe and foot warmer. 3,935,856, Cl. 126-208.000.
Logan, David J.: *See*—
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Welschof, Hans-Heinrich, 3,935,717.
Loje, Michael R. Pleat counter apparatus. 3,935,997, Cl. 235-98.00C.
Long, Donald L. Door lock protector. 3,936,085, Cl. 292-264.000.
Long Mfg. N. C., Inc.: *See*—
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Long, William R., to Long Mfg. N. C., Inc. Container for bulk tobacco. 3,935,959, Cl. 220-22.000.
Longeval, Antoon B. Rotary internal combustion engine. 3,935,841, Cl. 123-8.470.
Longman, Millard D.: *See*—
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Lorenz, Gunter; Korte, Siegfried; and Suling, Carlhans, to Bayerwerk Aktiengesellschaft. Gloss-stabilised fibres and films of acrylonitrile copolymers. 3,936,513, Cl. 260-898.000.
Loubal, Peter S. Process and apparatus for evaluating subregions. 3,936,667, Cl. 235-185.000.
Lowder, James E.; and Perry, Gary D., to Eagle-Picher Industries, Inc. Pin retention device. 3,936,203, Cl. 403-154.000.
Lowe, Benjamin L.: *See*—
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Lowe, Jack Bruner: *See*—
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Lucas Electrical Company Limited, The: *See*—
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Luce, Robert L.; and Bovaird, Arthur J., to Fairchild Camera and Instrument Corporation. Process for forming sloped topography contact areas between polycrystalline silicon and single-crystal silicon. 3,936,331, Cl. 156-17.000.
Luce, Robert L.: *See*—
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Ludwig, George, to Bendix Corporation, The. Nonlinear vacuum spark advance system. 3,935,843, Cl. 123-117.00A.
Luongo, Albert Michael; Reynolds, Frank J.; and Ruetsch, Rudolph R., to Thomas & Betts Corporation. Method and gauge for nondestructively testing and certifying the workable qualities of a casting. 3,935,730, Cl. 73-100.000.
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M. Lowenstein & Sons, Inc.: *See*—
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Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co. Ltd. Electric hand tool. 3,935,909, Cl. 173-163.000.
Mabuchi Motor Co. Ltd.: *See*—
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 3,935,909.
Machanian, William V.; and Williams, Robert R., to Wurlitzer Company, The. Electronic piano circuit. 3,935,783, Cl. 84-1.210.
Macheel, Gary W., to United States of America, Air Force. Offset reduction apparatus for analog circuits. 3,936,759, Cl. 328-162.000.
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Maier, Karl; and Hartwig, Ernst, to BASF Aktiengesellschaft. Blue anthraquinoid disperse dyes, their production and use. 3,936,477, Cl. 260-380.000.
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Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.

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Marceau, Daniel J.: *See*—
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Margetts, Hugh Grenville, to Girling Limited. Pivotable closed loop type disc brake. 3,935,928, Cl. 188-73.400.

Marin, Glenn R., to Carborundum Company, The. Oxidation resistant carbonaceous bodies and method of producing same. 3,936,574, Cl. 428-408.000.

Maroth, Arthur M. Counterbalanced mechanical speed-change mechanism. 3,935,750, Cl. 74-61.000.

Marsden, Brian D.: *See*—
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Marshall, Susan Kathryn; Gerding, Thomas Graham; and King, Elmer Miller, to Calgon Consumer Products Company Inc. Polymeric film dryer-added fabric softening compositions. 3,936,538, Cl. 427-242.000.

Marshall, Victor Gregory; and Thompson, John Maurice, to Redpath Dorman Long Limited. Profiling of metals. 3,936,714, Cl. 318-576.000.

Mart, Milam E. Developer apparatus for lithographic plate processing system. 3,936,853, Cl. 354-297.000.

Martin, Fred David: *See*—
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Martin, William F., to Raymond Lee Organization, Inc., The, a part interest. Back rubbing device. 3,936,198, Cl. 401-8.000.

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Marton, Miksa. Vacuum attachment for abrading machine. 3,935,678, Cl. 51-170.00T.

Martuch, Leon L., to Scientific Anglers, Inc. Process for producing a buoyant fishing line. 3,936,335, Cl. 156-79.000.

Marumoto, Ryuji; Yoshioka, Yoshio; Honjo, Mikio; and Kawazoe, Katsuyoshi, to Takeda Chemical Industries, Ltd. 2,6-Diaminonebularine derivatives. 3,936,439, Cl. 260-211.50R.

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Marxer, Adrian, to Lonza Ltd. Process for the preparation of pure dehydroacetic acid. 3,936,359, Cl. 203-6.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
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Masonry Systems International, Inc.: *See*—
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Massie, Harold Lee; and Cosentino, Louis C., to Renal Systems, Inc. Air leak detector. 3,935,876, Cl. 137-177.000.

Masson Scott Thrissell Engineering Limited: *See*—
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Masters, Christopher F. Method and apparatus for machining cylindrical tubes. 3,935,766, Cl. 82-21.00A.

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Masuyama, Takeshi; Matsuura, Mikio; Iida, Yoshio; and Amemiya, Toshioki, to Matsushita Electric Industrial Co., Ltd. Voltage variable resistor. 3,936,396, Cl. 252-518.000.

Mathues, Thomas P.; and Parker, Donald L., to General Motors Corporation. Dual power brake booster. 3,935,709, Cl. 60-547.000.

Matsubara, Takashi; Takeuchi, Yuko; and Hirose, Toshiro, to Toagosei Chemical Industry Co., Ltd. Steel plate bonding process and primer composition. 3,936,342, Cl. 156-330.000.

Matsubara, Toru, to Tokyo Juki Kogyo Kabushiki Kaisha. Print hammer device. 3,935,813, Cl. 101-93.310.

Matsuda, Akira: *See*—
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Matsumoto, Akira; and Itani, Katsutoshi, to Tokai Denka Kogyo Kabushiki Kaisha. Copper and copper alloy etching solutions and process. 3,936,332, Cl. 156-18.000.

Matsumura, Isao, to Canon Kabushiki Kaisha. Eye-fundus camera easy for alignment of pupil. 3,936,844, Cl. 354-62.000.

Matsuo, Masatoshi: *See*—
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Matthews, Charles W.; and Patel, Jitendra G., to Institute of Gas Technology. Coal ash agglomeration device. 3,935,825, Cl. 110-165.00R.

Matthews, Ralph W., to Caterpillar Tractor Co. Hydraulic tank reservoir pressure and vacuum stabilizer system. 3,935,882, Cl. 138-30.000.

Matuo, Ichiro; and Ohki, Sadao, to Ohki, Sadao. Anti-arrhythmic agents. 3,936,449, Cl. 260-247.20A.

Matzen, Walter T.; and Kendall, Don L., to Texas Instruments Incorporated. Spreading resistance thermistor. 3,936,789, Cl. 338-22.0SD.

Mauvernay, Roland Yves; Bush, Norbert; Simond, Jacques; Monteil, Andre; and Moleyre, Jacques, to Centre Europeen de Recherches Mauvernay "C.E.R.M.". Anti-inflammatory agents and method for their preparation. 3,936,450, Cl. 260-247.70Z.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
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Maxson, Orwin G., to Continental Oil Company. Method of preparing an insulated negative buoyancy flow line. 3,935,632, Cl. 29-455.00R.

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McCallum, James B. Phosphorescent fishing lure. 3,935,659, Cl. 43-17.600.

McCarthy, Robert V., to Armstrong Cork Company. Gap filler for rheometer. 3,935,729, Cl. 73-60.000.

McCartney, Ronald L., to International Telephone and Telegraph Corporation. Fiber optic alignment sleeve. 3,936,145, Cl. 350-96.00C.

McClay, Alexander W., Jr. Multiple gauging device. 3,935,767, Cl. 83-5.000.

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McCloud, Marvin H.; and McCloud, Delores J., to McCloud, Marvin H., Sr. Tire traction device. 3,935,891, Cl. 152-225.00R.

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McDonald, Alexander Duncan, to Cam Gears Limited. Composite bearing. 3,936,101, Cl. 308-26.000.
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McElroy, Robert C., to Cable Climber Safety Devices Incorporated. Load limiter. 3,936,622, Cl. 200-85.00R.
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McQueen, Robert William, to Dresser Industries, Inc. Earth boring bit with means for conducting heat from the bit's bearings. 3,935,911, Cl. 175-17.000.
McVeigh, James H., to Xerox Corporation. Liquid crystalline platen for an electrophotographic printing machine. 3,936,172, Cl. 355-3.00R.
McVoy, David S., to Coaxial Scientific Corporation. Code operated switching device for communications systems and the like. 3,936,747, Cl. 325-30.000.
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Middle, Sidney A. Apparatus and method for treatment of water oligodynamically. 3,936,364, Cl. 426-66.000.
Middleton, Robert; and Smith, William E., to United Technologies Corporation. Method of affixing an abradable metallic fiber material to a metal substrate. 3,936,656, Cl. 219-76.000.
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Milano, Gerard M., to Arvey Corporation. Pouches. 3,935,810, Cl. 99-467.000.
Miller, Charles P.: *See—*
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Miller, David J.; and Miller, Charles P., to Miller Formless Co., Inc. Drainage ditch mule. 3,936,211, Cl. 404-104.000.
Miller, Eugene J., Jr.; and Tiefenthal, Harlan E., to Akzona Incorporated. Aryl-substituted aliphatic diquaternary compounds. 3,936,503, Cl. 260-567.60P.
Miller Formless Co., Inc.: *See—*
Miller, David J.; and Miller, Charles P., 3,936,211.
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Dusanek, Norman G., 3,936,874.
Miller, Gregory H., to Dart Industries Inc. Electrical connector. 3,936,126, Cl. 339-95.00D.
Miller, Jack E. Refuse collector and bagging device. 3,935,692, Cl. 53-126.000.
Miller, Laurence G.: *See—*
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Miller Printing Machinery Co.: *See—*
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Miller, William A.; and Robinson, Brian W., to Allied Chemical Corporation. Metals coated with 3,3,3-trifluoro-2-trifluoromethyl propene/vinylidene fluoride copolymer compositions. 3,936,569, Cl. 428-339.000.
Milligan, Robert Ian: *See—*
Blythe, Alan Avery; and Milligan, Robert Ian, 3,936,017.
Milligan, Terry W.; and Wright, Richard F., to Polaroid Corporation. Method and device for determining the concentration of a substance in a fluid. 3,936,357, Cl. 195-103.50R.
Millipore Corporation: *See—*
Grandine, Joseph D.; and Snyder, James E., 3,935,646.
Mills, Walter D., to Shell Oil Company. Fuel vaporizing device for an internal combustion engine or gas turbine. 3,935,849, Cl. 123-122.0AA.
Milton, A. Fenner, to United States of America, Navy. Multiple optical connector. 3,936,141, Cl. 350-96.00C.
Minagawa, Nobuhiko: *See—*
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Minami, Teruo, to Kabushiki Kaisha Komatsu Seisakusho. Device for detecting the opening of throttle valve of diesel engine for vehicle. 3,936,754, Cl. 328-1.000.

Mine, Akihiko: *See—*
Satomi, Takeo; Mukai, Kunio; Mine, Akihiko; Hino, Naganori; Tateishi, Kohshi; and Hirano, Masachika, 3,936,433.
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Minoda, Minoru; Masuda, Haruo; Suzuki, Mitsuru; and Chikamasa, Hirohi, to Fuji Photo Film Co., Ltd. Process for producing gelatino-silver halide photographic light-sensitive materials having a high silver halide content. 3,936,306, Cl. 96-87.00R.
Minolta Camera Kabushiki Kaisha: *See—*
Ikeda, Hiroshi, 3,936,150.
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Miyaoka, Senri, to Sony Corporation. Video signal reproducing device with electron beam scanning velocity modulation. 3,936,872, Cl. 358-64.000.
Miyashita, Akitoshi: *See—*
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Miyazaki, Tashirou, to Nomi Bosaikogyo Kabushiki Kaisha. Hose reel device for fire extinguishing appliance. 3,935,879, Cl. 137-355.160.
Miyazawa, Yoshihide; Ozutsumi, Minoru; Ogawa, Satoshi; Saeki, Keiso; and Watanabe, Akio, to Hodogaya Chemical Co., Ltd.; and Fuji Photo Film Co., Ltd. Pressure-sensitive copying paper containing lactone compounds of pyridine-carboxylic acid. 3,936,564, Cl. 428-307.000.
Miyoshi, Keisuke; and Shibano, Naoki, to Matsushita Electric Industrial Co., Ltd. High voltage generator for a television receiver. 3,936,719, Cl. 321-2.000.
Mizrach, Murray. Multiple garment hanger. 3,935,976, Cl. 223-88.000.
Mizuguchi, Norio: *See—*
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Mohn, Gerhard: *See—*
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Mohon, Windell N., to United States of America, Navy. Multi-wavelength display system. 3,936,871, Cl. 358-56.000.
Mohr, Walter, to Braun Aktiengesellschaft. Magnetically latched piezoelectric striking igniter. 3,936,678, Cl. 310-8.700.
Moleyre, Jacques: *See—*
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Molitor, Arvid A. Flow indicator. 3,935,737, Cl. 73-228.000.
Moll, Dean H.; and Greiner, Alan, to Singer Company, The. Balancing system for a rotating mass. 3,935,746, Cl. 73-462.000.
Molsons Companies Limited, The: *See—*
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Momose, Haruhiko, to Konishiroku Photo Industry Co., Ltd. Distance measuring device. 3,936,187, Cl. 356-1.000.
Monnet, Francois, to S.A.R.L. Sud est Electro Mecanique S.E.E.M. Process and apparatus for the measurement of volume, flow rate and consumption, at a predeterminable pressure, of combustible liquid by an apparatus in place and functioning. 3,935,732, Cl. 73-118.000.
Monnin, Andre: *See—*
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Moore, David L.: *See—*
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Moore, Donald G., to Chemetron Corporation. Method of heating comestibles. 3,936,626, Cl. 219-10.55M.
Moore, Donald W. Reflector lamp cooling and containing assemblies. 3,936,686, Cl. 313-36.000.
Moore, Paul: *See—*
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Moore, Samuel D.: *See—*
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Moores, Robert Gordon, Jr.; and Walton, Richard Eugene, II, to Black and Decker Manufacturing Company, The. Bearing mounting system. 3,936,100, Cl. 308-15.000.
Moorhouse, Stephen, to David Brown Tractors Limited. Brake operating systems. 3,935,932, Cl. 192-13.00R.
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Morgan, Charles R., to W. R. Grace & Co. Method for preparing coatings using curable solid styrene-allyl alcohol copolymer based polyene and polythiol compositions. 3,936,530, Cl. 427-43.000.
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Mori, Yasunori: *See—*
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Morimoto, Takeshi: *See—*
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Morin, Bernard. Hand control apparatus for an aircraft usable by a person lacking use of his legs. 3,936,014, Cl. 244-83.00R.
Moriyama, Inao; Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, to Canon Kabushiki Kaisha. Electrostatic copying machine. 3,936,177, Cl. 355-4.000.
Morrison, Charles R., to Truck-Lite Company, Inc. Lamp mounting assembly. 3,936,127, Cl. 339-97.00L.
Morse, John B., to Polaroid Corporation. Carrying strap attachment for a photographic camera. 3,936,845, Cl. 354-82.000.
Mosby, William Lindsay, to American Cyanamid Company. Hydrazono-1,3,2-dithiarsetanes, -stannetanes and -stibitanes. 3,936,481, Cl. 260-429.700.
Motorola, Inc.: *See—*
DiGianfilippo, Dominic J.; and Nickerson, Douglas W., 3,936,616.
Gay, Michael J., 3,936,711.
Mowbray, Dorian Farrar, to C.A.V. Limited. Fuel injection pumping apparatus with timing adjustment. 3,936,232, Cl. 417-206.000.
Moyle, Kenneth J., to National Semiconductor Corporation. MISFET and method of manufacture. 3,936,862, Cl. 357-41.000.
Mrlik, Jerry R., to General Motors Corporation. Corner seal coil spring arrangement for rotary engine. 3,936,250, Cl. 418-121.000.
Muehllehner, Gerd, to G. D. Searle & Co. Method for making corrugated collimators for radiation imaging devices. 3,936,340, Cl. 156-210.000.
Mueller, Richard J.: *See—*
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Muesse, Allen R., and Wright, Jess C., to Communications Components Corporation. VLF navigation system. 3,936,828, Cl. 343-105.00R.
Mukai, Kunio: *See—*
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Mulch, Hans, to Ernst Leitz G.m.b.H. Circular magazine for a slide projector. 3,935,652, Cl. 40-78.000.
Mulhern, Philip J. Pet feeder. 3,935,837, Cl. 119-51.120.
Muller-Girard, Otto; and Bray, Chester W., to Bernz-O-Matic Corporation. Smoke detector and alarm. 3,936,814, Cl. 340-237.00S.
Muller, Thomas P., to Caterpillar Tractor Co. Engine enclosure having a counterweight mounting device secured thereon. 3,935,921, Cl. 180-89.00R.
Muller, Wolfgang, to Th. Goldschmidt AG. Smokeless fluxing agent for hot-tinning, hot-galvanizing, and hot-leading of articles made from iron. 3,936,326, Cl. 148-26.000.
Multi Fab. Inc.: *See—*
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Multi-State Devices, Ltd.: *See—*
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Mumm, Howard W.: *See—*
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Murakami, Noboru, to Aisin Seiki Kabushiki Kaisha. Hydraulic pressure regulating system. 3,935,793, Cl. 91-446.000.
Murakami, Sanjiro, to Minolta Camera Kabushiki Kaisha. Variable characteristic light filter. 3,936,147, Cl. 350-158.000.
Murakami, Shinichi, to Rank Xerox Ltd. Support structure for a duplicator optical system. 3,936,179, Cl. 355-11.000.
Muraoka, Teruo: *See—*
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Murata, Yoshihiro: *See—*
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Murata, Yuich, to Dai Nippon Toryo Kabushiki Kaisha. Flat display system. 3,936,816, Cl. 340-336.000.
Murphy, Eugene Scott; and Stevens, Clyde Bennett, to General Signal Corporation. Hydraulic control system. 3,935,707, Cl. 60-444.000.
Murphy, William D.: *See—*
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Murray, Pierre Charles; and Chattin, Richard Maclay, to Illinois Tool Works Inc. Self-drilling rivet. 3,935,786, Cl. 85-68.000.
Murray, Stephen C. Hang glider. 3,936,012, Cl. 244-16.000.
Muska, Willis Martin, to Bell Telephone Laboratories, Incorporated. Optical fiber power tap. 3,936,631, Cl. 250-227.000.
Mutafelija, Boris A., to Westinghouse Electric Corporation. Training simulator and method for nuclear power plant heater and non-linear modeling. 3,936,885, Cl. 444-1.000.
Nabeyama, Hiroaki: *See—*
Yanagimachi, Akio; Uehara, Takashi; Yamamoto, Tetsuo; Yamane, Hisakichi; Suwabe, Eiichi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,936,595.
Nagahama, Shizuo; Shimada, Keizo; Nishikawa, Takeo; and Harada, Toshiaki, to Teijin Limited. Process for separating dimethyl naphthalenes comprising 2,6-dimethyl naphthalenes as main component. 3,936,509, Cl. 260-674.00N.
Nagao, Shozo; Mitani, Naoyuki; Ikuta, Michinobu; and Fujisawa, Kenji, to Toray Industries, Inc. Vibratory material of paper pulp and carbon fibers. 3,935,924, Cl. 181-169.000.
Nagasawa, Takeshi; Kuroiwa, Katumasa; and Narita, Kouichi, to Nitto Boseki Co., Ltd. Process of producing pyrimidyl thiocarbonates. 3,936,452, Cl. 260-251.00R.
Naito, Hideki: *See—*
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Naito, Hiroyuki: *See—*
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Nakagawa, Toru; and Mihashi, Takashi, to Hitachi, Ltd.; and Nissan Motor Co., Ltd. Carburetor having an altitude-effects compensation mechanism and a method for the manufacture of same. 3,936,516, Cl. 261-39.00A.
Nakamura, Takashi, to Sony Corporation. Automatic gain control for color television camera with reproduced color fidelity. 3,936,870, Cl. 358-27.000.
Nakao, Masaru: *See—*
Yamamoto, Hisao; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; and Katayama, Shigenari, 3,936,468.
Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Process of manufacturing semiconductor devices. 3,936,328, Cl. 148-171.000.
Nakata, Yoshinori: *See—*
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Nakayama, Takahiro: *See—*
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Nakazawa, Mitsunobu: *See—*
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Nanba, Yasuhiro; and Matsuda, Motonobu, to Minolta Camera Kabushiki Kaisha. Automatic exposure time control circuitry for a camera using a photodiode as a light measuring element. 3,936,842, Cl. 354-24.000.
Nanoux, Jean, to Solvay & Cie. Adhesive lacquer, process for its use and products thereof. 3,936,341, Cl. 156-242.000.
Narita, Kouichi: *See—*
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Nath, Amar, to Drexel University. Method of labeling complex metal chelates with radioactive metal isotopes. 3,936,440, Cl. 260-211.700.
National Research Development Corporation: *See—*
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Phillips, Leslie Nathan, 3,936,336.
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Natsuume, Tadao, to Nippon Zeon Co., Ltd. Hydraulic composition. 3,936,310, Cl. 106-90.000.
Naylor, Kenneth. Foldable carton tray. 3,935,989, Cl. 229-31.00R.
NCR Corporation: *See—*
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Neal, Archie E.; and Moore, Paul, to J. E. Love Company. Adjustable height soil conditioner with frame extending rearwardly from cultivating implement. 3,935,906, Cl. 172-177.000.
Nelson, Norman A., to Upjohn Company, The. 3-Oxa prostaglandin Fα-type compounds. 3,936,487, Cl. 260-468.00D.
Nerodenko, Mikhail Minovich: *See—*
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.
Nettli, Per, to A/S Apothekernes Laboratorium for Specialpraeparater. Process for dewatering a proteinaceous, aqueous sludge and for removing and recovering precipitating agents from a precipitate containing proteinaceous substances. 3,936,375, Cl. 210-45.000.
Neuhierl, Hermann. Connector arrangement for detachable fastening of airplane wings to the fuselage of model airplane. 3,935,664, Cl. 46-76.00R.
Neumann, Rudolf, to Heinz Kettler Metallwarenfabrik. Table tennis net holder. 3,936,049, Cl. 273-30.000.
Neuschel, James K. Wire inserting apparatus for tire treads. 3,935,982, Cl. 227-101.000.
New Age Mirror & Tile Industries: *See—*
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Newitt, John Henry. Electronic image density analysis. 3,936,598, Cl. 178-6.800.
Newman, Douglas A., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Pressure-sensitive transfer elements. 3,936,559, Cl. 428-212.000.
Newmar, Julie. Brassiere. 3,935,865, Cl. 128-488.000.
Newton, Alwin B., to Borg-Warner Corporation. Vapor condenser for a refrigeration system. 3,935,715, Cl. 62-475.000.
Nicholl, Thomas H. Lantern and support structure therefor. 3,936,022, Cl. 248-137.000.
Nickerson, Douglas W.: *See—*
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Nicolay, Karl; and Osten-Sacken, Ernst V. D., to Dürkoppwerke GmbH. Method of and apparatus for feeding a workpiece along a surface of a sewing machine. 3,935,826, Cl. 112-212.000.
Niedermayr, Alois: *See—*
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Nielsen, Edward G.: *See—*
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Nihon Denshi Kabushiki Kaisha: *See—*
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Niimi, Itaru; Kaneko, Yasuhisa; Komiyama, Yoshiro; Tokui, Masaaki; Kondo, Katsumi; and Kouno, Akio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Wear and seizure resistant aluminum alloy piston. 3,935,797, Cl. 92-223.000.
Nippon Electric Company Limited: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Paint Company Ltd.: *See—*
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Nippon Telegraph and Telephone Public Corporation: *See—*
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Nishibayashi, Yoshifumi: *See—*
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Nishigori, Shogo; and Kusama, Masahiko, to Hitachi, Ltd. Camp-on detecting system for automatic telephone exchange. 3,936,613, Cl. 179-18.0BG.

Nishikawa, Takeo: *See—*
Nagahama, Shizuo; Shimada, Keizo; Nishikawa, Takeo; and Harada, Toshiaki, 3,936,509.

Nishimiya, Torazo; and Mori, Yasunori, to Hitachi, Ltd. Ignition timing control system. 3,935,844, Cl. 123-117.00R.

Nishioka, Matsuo; Oka, Shunzo; Miyashita, Akitoshi; and Oshima, Kazuo, to Matsushita Electric Industrial Co., Ltd. Combined variable resistor assembly provided with tap position indicator means. 3,936,795, Cl. 338-119.000.

Nissan Motor Company Limited: *See—*
Aono, Shigeo; and Mizuguchi, Norio, 3,935,845.
Aya, Norimoto; Takahashi, Kunihoiro; Osaka, Kenji; and Kusunose, Naohito, 3,936,090.
Ishizawa, Toshitugu; Akahori, Motokazu; and Sato, Hideki, 3,935,842.
Nakagawa, Toru; and Mihashi, Takashi, 3,936,516.

Nissha Printing Co., Ltd.: *See—*
Iwata, Torayoshi, 3,936,570.

Nitto Boseki Co., Ltd.: *See—*
Nagasawa, Takeshi; Kuroiwa, Katumasa; and Narita, Kouichi, 3,936,452.

Nitto Electric Industrial Co., Ltd.: *See—*
Ishizuka, Takashi; and Miwa, Naoki, 3,936,404.

Nixon, John M.; and Younkin, James R., to Edo-Aire Mitchell Industries, Inc. Electronic trim system. 3,936,715, Cl. 318-580.000.

Noguchi, Katsumi: *See—*
Ogasawara, Yoshiaki; and Noguchi, Katsumi, 3,936,579.

Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Method of reconstructing holograms using a reflected undiffracted beam as a reconstruction beam. 3,936,138, Cl. 350-3.500.

Nomi Bosaikogyo Kabushiki Kaisha: *See—*
Miyazaki, Tashirou, 3,935,879.

Nomura, Katsuhiko: *See—*
Kurei, Hiroshi; Urano, Fumio; and Nomura, Katsuhiko, 3,936,843.

Nomura, Tatsuo, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Incorporated. Paper composed mainly of pullulan fibers and method for producing the same. 3,936,347, Cl. 162-146.000.

Nomura, Tatsuo: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Koiwa, Yoichi; Miike, Akira; Nomura, Tatsuo; and Kobayashi, Shohei, 3,936,469.

Norberg, Lars, to Stal-Laval Turbin AB. Releasable axial clutch. 3,935,934, Cl. 192-46.000.

Nordquist, Oscar M. Power turbine. 3,936,224, Cl. 415-203.000.

Nordstrom, Kjell Helge; and Ahl, Nils Goran, to Aktiebolaget Smaefa. Vehicle platform scale. 3,935,914, Cl. 177-134.000.

Northern Electric Company Limited: *See—*
Korver, Klaas, 3,936,602.

Northrop Corporation: *See—*
Grossman, Norman J.; and Linder, Jacques F., 3,936,866.

Northup, Edwin M.; Moore, David L.; and Shaver, J. Lyle, to Allis-Chalmers Corporation. Grain loss monitor. 3,935,866, Cl. 130-24.000.

Norton, Ian Fredric; and O'Grady, James, to Crane Canada Limited. Flush valve. 3,936,028, Cl. 251-5.000.

Norwood, Orin Wyatt: *See—*
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 3,936,253.

Nosaka, Ihachi. Eyeglasses. 3,936,165, Cl. 351-128.000.

Nova, Vittorio Emanuele: *See—*
Ligorati, Ferdinando; Nova, Vittorio Emanuele; and Aglietti, Giancarlo, 3,936,507.

Novak, Gary W., to Cook Electric Company. Gas tube arrester subassembly. 3,936,785, Cl. 337-29.000.

Nuclear Battery Corporation: *See—*
Goslee, David Earl; and Barr, Harold Newton, 3,936,320.

Nuova San Giorgio S.p.A.: *See—*
Piro, Mario, 3,935,629.

N.V. Werktuigenfabrieke Mulder: *See—*
van Vliet, Cors, 3,935,855.

Obeginski, Carl, to Burroughs Corporation. Method and apparatus for altering the synchronous compare character in a digital data communication system. 3,936,601, Cl. 178-22.000.

Obenshain, David Noel, to Westvaco Corporation. Tandem collect single web sheet cutter and stacker. 3,935,769, Cl. 83-79.000.

O'Brien, Paul J., to Barcus-Berry, Inc. End plug adapter. 3,935,782, Cl. 84-1.160.

Oda, Yoshio; Uchida, Keiichi; Suhara, Manabu; and Morimoto, Takeshi, to Asahi Glass Company, Ltd. Process for preparing unsaturated aldehyde having three to four carbon atoms. 3,936,505, Cl. 260-604.00R.

Oehlerking, Erwin L. Concrete float and accessory therefor. 3,936,210, Cl. 404-89.000.

Ogasawara, Yoshiaki; and Noguchi, Katsumi, to Nippon Kogaku K.K. Absorbent film produced by vacuum evaporation. 3,936,579, Cl. 428-432.000.

Ogawa, Satoshi: *See—*
Miyazawa, Yoshihide; Ozutsumi, Minoru; Ogawa, Satoshi; Saeki, Keiso; and Watanabe, Akio, 3,936,564.

Ogoltsova, Evgenia Sergeevna: *See—*
Akopov, Ernest Mikhailovich; Kapitanov, Nikolai Nikolaevich; Strekopytov, Alexei Alexeevich; Ogoltsova, Evgenia Sergeevna; and Paches, Alexandr Ilich, 3,935,981.

O'Grady, James: *See—*
Norton, Ian Fredric; and O'Grady, James, 3,936,028.

Ogura, Iwao: *See—*
Yamazaki, Eiichi; Ueda, Toshio; Maruyama, Koichi; and Ogura, Iwao, 3,936,151.

Ogura, Toshinobu, to Minolta Camera Kabushiki Kaisha. Retrofocus type objective lens system. 3,936,153, Cl. 350-216.000.

Ohara, Katsunobu: *See—*
Moriyama, Inao; Ando, Yujiro; Ohara, Katsunobu; and Tanaka, Keiji, 3,936,177.
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Ohata, Keiichi: *See—*
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Ohki, Sadao: *See—*
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Ohman, Rolf Gunnar: *See—*
Krakau, Carl Erik Torsten; and Ohman, Rolf Gunnar, 3,936,162.

Ohnishi, Yasushi; and Matsuura, Shunichi, to Perkin-Elmer Corporation, The; and Hitachi, Ltd. Fluorescence spectrophotometer for absorption spectrum analysis. 3,936,190, Cl. 356-96.000.

Oka, Shunzo: *See—*
Nishioka, Matsuo; Oka, Shunzo; Miyashita, Akitoshi; and Oshima, Kazuo, 3,936,795.

Okamasa, Makoto: *See—*
Sugimoto, Yukio; Okamasa, Makoto; and Fukumura, Toyoshi, 3,936,619.

Okamoto, Michio; Izawa, Shigeru; and Hara, Michio, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for indicating relative azimuth. 3,935,645, Cl. 33-363.00R.

Okazaki, Kakumichi. Apparatus for manufacturing spiral tubes. 3,935,801, Cl. 93-80.000.

Olah, Stephen: *See—*
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Olin Corporation: *See—*
Bruson, Herman A.; and Gould, Henry, 3,936,498.

Olmstead, John Aaron, to RCA Corporation. Integrated power transistor with ballasting resistance and breakdown protection. 3,936,863, Cl. 357-51.000.

Olmsted, Bernie A., to Package Machinery Company. Mixer for plastic injection molding machine. 3,936,038, Cl. 259-191.000.

Olson, John W., to C & D Valve Manufacturing Company. Method and apparatus for maintaining and servicing a pressurized refrigeration system or the like. 3,935,713, Cl. 62-77.000.

Olsson, Jons Kurt Alvar: *See—*
Hjortendal, Royne Gunnar; and Olsson, Jons Kurt Alvar, 3,936,612.

Olympia Werke AG: *See—*
Schmidt, Uwe; and Chvatlinsky, Kurt, 3,935,939.

Olympus Optical Co., Ltd.: *See—*
Imai, Toshihiro, 3,936,149.

Omnium Financier Aquitaine pour l'Hygiene et la Sante (Sanofi): *See—*
Ardry, Robert; and Robilliart, Michel, 3,936,434.

Omron Tateisi Electronics Co., Ltd.: *See—*
Tanaka, Toshio; Hirayama, Mamoru; and Minami, Noriaki, 3,935,933.

Onal, Hasan F., to Sundstrand Corporation. Jet boat pump. 3,935,833, Cl. 115-12.00R.

Ondocsin, John: *See—*
Wright, William Paul; Shafer, Leroy; Ondocsin, John; and Carter, Ivor W., 3,935,851.

O'Neill, Joseph L., Jr., to Ultronic Systems Corporation. Data storage and processing apparatus including processing of repeat character sequences. 3,936,808, Cl. 340-172.500.

Onoye, Hideo: *See—*
Takahashi, Nobuaki; Onoye, Hideo; Muraoka, Teruo; and Kasuga, Masao, 3,936,618.

Opocrin S.r.l.: *See—*
Bianchini, Pietro, 3,936,351.

Optotechnik Heine KG: *See—*
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Orchard Corporation of America, The: *See—*
Santurri, Pasco R.; Mumm, Howard W.; and Yockey, Thomas E., 3,936,560.

Oregon Graduate Center for Study and Research: *See—*
Barofsky, Douglas F., 3,936,532.

Orem, Henry Philip; Hart, David R.; and Hill, Jerry E., to United States Pipe and Foundry Company. Process for producing salts of hexamethylenetetramine. 3,936,451, Cl. 260-248.500.

Orlando, Anthony W.; and Weidenhammer, James A., to International Business Machines Corporation. Air damped head suspension. 3,936,881, Cl. 360-103.000.

Orlando, Anthony W.: *See—*
McGinnis, Bernard W.; Orlando, Anthony W.; and Weidenhammer, James A., 3,936,880.

Orlova, Valentina Petrovna: *See—*
Balitsky, Vladimir Sergeevich; Khetchikov, Lev Nikolaevich; Orlova, Valentina Petrovna; and Balitskaya, Ljudmila Vasilievna, 3,936,276.

O'Rourke, James L. Toothbrush with dentifrice attachment. 3,936,200, Cl. 401-184.000.

Orr, John L., to Keystone Consolidated Industries, Inc. Privacy lock. 3,936,084, Cl. 292-169.150.

Ortho Pharmaceutical Corporation: *See—*
Karmas, George, 3,936,493.

Orthopedic Equipment Company, Inc.: *See—*
Harroff, Marlin R., 3,935,858.

Osaka, Kenji: *See—*
Aya, Norimoto; Takahashi, Kunihoiro; Osaka, Kenji; and Kusunose, Naohito, 3,936,090.

Oshima, Kazuo: *See—*
Nishioka, Matsuo; Oka, Shunzo; Miyashita, Akitoshi; and Oshima, Kazuo, 3,936,795.

Osten-Sacken, Ernst V. D.: *See—*
Nicolay, Karl; and Osten-Sacken, Ernst V. D., 3,935,826.

Ostevik, Petter P. Arrangement in heat input to a gully for draining water in order to avoid accumulation of snow and ice. 3,935,878, Cl. 137-334.000.

Ota, Michihiro, to Nippon Electric Company Limited. Insulated gate field effect transistor having high transconductance. 3,936,857, Cl. 357-23.000.

Otis Engineering Corporation: *See—*
Arendt, Henry P., 3,935,903.

Oude Alink, Bernardus A.; and Hutton, Ronald P., to Petrolite Corporation. Hexahydropyrimidines as fuel additives. 3,936,279, Cl. 44-63.000.

Overbury, Francis G., to International Standard Electric Corporation. Method of radio navigation. 3,936,829, Cl. 343-106.00R.

Overbury, Francis G., to International Standard Electric Corporation. Doppler navigation system with tracking filter for multipath discrimination. 3,936,830, Cl. 343-113.0DE.

Owens-Corning Fiberglas Corporation: *See—*
Bolen, Gerhard N.; Dunbar, Sidney C.; and Smock, George E., 3,936,558.
Coakley, Thomas A., 3,936,415.
Dunkailo, Peter A., 3,936,286.

Owens-Illinois, Inc.: *See—*
Doucette, Eugene F., 3,935,967.
Dunlap, Glenn H.; and Foote, James B., 3,936,048.
Pei, Yu K., 3,936,288.
Rapp, James E., 3,936,397.

Owings, Kenneth B. Carts. 3,936,070, Cl. 280-47.180.

Oxford Pendaflex Corporation: *See—*
Chitester, John Alvin, 3,936,108.

Ozalid Group Holdings Limited: *See—*
Hill, Frank Arthur, 3,936,181.

Ozutsumi, Minoru: *See—*
Miyazawa, Yoshihide; Ozutsumi, Minoru; Ogawa, Satoshi; Saeki, Keiso; and Watanabe, Akio, 3,936,564.

Pacaud, Jean. Sewage treatment apparatus. 3,936,381, Cl. 210-195.00R.

Paccar Inc.: *See—*
Schiel, Douglas W., 3,935,920.

Pacheco, James F.: *See—*
Corliss, Duncan S.; and Pacheco, James F., 3,936,386.

Paches, Alexandr Ilich: *See—*
Akopov, Ernest Mikhailovich; Kapitanov, Nikolai Nikolaevich; Strekopytov, Alexei Alexeevich; Ogoltsova, Evgenia Sergeevna; and Paches, Alexandr Ilich, 3,935,981.

Package Machinery Company: *See—*
Olmsted, Bernie A., 3,936,038.

Page, Bernard F.: *See—*
Smith, Vernon J.; Smith, Howard M.; Page, Bernard F.; and Miller, Laurence G., 3,936,042.

Palin, Alfred; and Slack, John Wesley, to Imperial Chemical Industries Limited. Destructible type switch having frangible conductive element. 3,936,621, Cl. 200-61.080.

Palmer, Winslow, to United States of America, Navy. Null input OMEGA tracking filter system. 3,936,763, Cl. 329-104.000.

Pannone, Robert John; and Surko, Walter Edward, Jr., to Emhart Corporation. Electromechanical door holder-closer. 3,935,614, Cl. 16-48.500.

Paolinelli, Antonio: *See—*
Piccolo, Luigi; Calcagno, Benedetto; Ghirga, Marcello; and Paolinelli, Antonio, 3,936,292.

Papalos, John G., to Diamond Shamrock Corporation. Method of reducing barre in synthetic polymide textiles dyed with acid dyes. 3,936,268, Cl. 8-173.000.

Papoff, Paolo; Guidarini, Dante; and Fragale, Carlo, to Consiglio Nazionale Delle Ricerche. Double pump device for mixing two or more liquids with variable relative ratios and concentrations. 3,935,971, Cl. 222-134.000.

Parker, Donald L.: *See—*
Mathues, Thomas P.; and Parker, Donald L., 3,935,709.

Parkinson, Robert E., to United States Steel Corporation. Coated metal fasteners. 3,936,407, Cl. 260-27.00R.

Parks, Harold G.; and Hughes, William C., to General Electric Company. Two-aperture immersion lens. 3,936,693, Cl. 313-427.000.

Pass & Seymour, Inc.: *See—*
Adams, William H., 3,936,699.

Patel, Girish: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,936,402.

Patel, Jitendra G.: *See—*
Matthews, Charles W.; and Patel, Jitendra G., 3,935,825.

Patton, James C., Jr.: *See—*
Vanderpool, Clarence D.; MacInnis, Martin B.; and Patton, James C., Jr., 3,936,362.

Patton, Tad L., to Exxon Research and Engineering Company. Formation of polyparabanic acid coatings and films by solvent treatment of powdered layer. 3,936,584, Cl. 428-458.000.

Paul Kuhbier & Co.: *See—*
Braun, Hans; and Mohn, Gerhard, 3,936,099.

Pavel, Raymond. Agricultural tool bar. 3,935,696, Cl. 56-385.000.

Pavenick, Stanford, to New Age Mirror & Tile Industries. Heat shrunk plastic film mirror. 3,936,159, Cl. 350-310.000.

Paxton, Gerald C., to SWF Machinery, Inc. Container assembling machine. 3,935,798, Cl. 93-39.00R.

Pech, Christian H.: *See—*
Gaudy, Claude Francois; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., 3,935,910.

Pecha, Ernst, to Bielomatik Leuze & Co. Apparatus for welding flexible members into a frame. 3,936,345, Cl. 156-502.000.

Pedersen, Thor: *See—*
Asphaug, Bjorn; and Pedersen, Thor, 3,936,588.

Pei, Yu K., to Owens-Illinois, Inc. Method for making a glass-ceramic recuperator. 3,936,288, Cl. 65-33.000.

Peil, William; and Hesler, Joseph P., to General Electric Company. Automatic gain control system. 3,936,599, Cl. 178-7.3DC.

Peil, William; and McFadyen, Robert J., to General Electric Company. AM-FM receiver having improved bias supply circuit. 3,936,750, Cl. 325-315.000.

Pelletier, Ronald R.: *See—*
Saunders, Frank L.; and Pelletier, Ronald R., 3,936,365.

Peltier, Henri; Catrain, Michel; and Monnin, Andre, to Regie Nationale des Usines Renault. Automatic camshaft lathe. 3,935,765, Cl. 82-19.000.

Pennsylvania Crusher Corporation: *See—*
Graf, Carl R.; Janes, Harry E.; and Slikas, Anthony W., 3,936,004.

Pennwalt Corporation: *See—*
Heimur, Karl, 3,936,641.
Smigel, Walter Andrew, 3,936,314.

Pennzoil Company: *See—*
Steinmetz, Walter Edmund, 3,936,392.

Pepe, Charles R. Pile hammers. 3,935,908, Cl. 173-127.000.

Percival, William Spencer, to EMI Limited. Method of producing a representation of a planar section of a body using scanning radiology. 3,936,636, Cl. 250-336.000.

Perez, Thomas. Coffee brewer. 3,935,804, Cl. 99-293.000.

Perkin-Elmer Corporation, The: *See—*
Ohnishi, Yasushi; and Matsuura, Shunichi, 3,936,190.

Perlmutter, David. Automotive alternator and solid state regulator tester. 3,936,744, Cl. 324-158.00R.

Perret, Jean-Pierre; and Vidon, Bruno, to Societe Anonyme: Pechiney Ugine Kuhlmann. Apparatus for the combustion of sulphur. 3,936,275, Cl. 23-278.000.

Perrin, Jack Louis; and Christensen, Stanley Theodore, to Towhaver, Inc. Construction and method of dispensing crimped paper toweling. 3,935,802, Cl. 93-84.00R.

Perry, Gary D.: *See—*
Lowder, James E.; and Perry, Gary D., 3,936,203.

Personal Products Company: *See—*
Kraskin, Kenneth S., 3,935,862.

Perstorp AB: *See—*
Konicek, Jiri K., 3,936,548.

Peter, Bruno E.; and Deetken, Reinhardt R., to Grede Foundries, Inc. Grinding fixture. 3,935,679, Cl. 51-239.000.

Petersen, Siegfried: *See—*
Petersen, Uwe; Kabbe, Hans-Joachim; and Petersen, Siegfried, 3,936,447.

Petersen, Uwe; Kabbe, Hans-Joachim; and Petersen, Siegfried, to Bayer Aktiengesellschaft. 7-Acylamino-desacetoxy-cephalosporanic acid esters and their production. 3,936,447, Cl. 260-243.00C.

Peterson, James A.; and Mc Cabe, Donald A., to Bimet Corporation. Temperature sensitive tipswitch. 3,936,786, Cl. 337-80.000.

Peterson, Wayne A.: *See—*
Hicks, Leon E.; Peterson, Wayne A.; and Schexnayder, Lawrence F., 3,935,918.

Petrolite Corporation: *See—*
Oude Alink, Bernardus A.; and Hutton, Ronald P., 3,936,279.
Winslow, Joseph D., Jr., 3,936,729.

Pfitzner, Helmut; and Dammert, Walter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the production of iron complexes of tetraazaannulenes. 3,936,445, Cl. 260-239.0DD.

Pfizer Inc.: *See—*
Wiedermann, Hans E., 3,936,455.

Pfund, Charles E. Method and apparatus for obtaining maximum sail boat velocity. 3,935,828, Cl. 114-102.000.

Phelan, Harry Richard, to Harris-Intertype Corporation. Directive disk feed system. 3,936,835, Cl. 343-753.000.

Philipp, Karl-Heinz: *See—*
Finsterwalder, Kurt; Philipp, Karl-Heinz; Veil, Martin; Widmann, Karl; and Zwerina, Karl, 3,935,724.

Phillips, James T., Jr. Non circular hoop. 3,935,668, Cl. 46-220.000.

Phillips, Leslie Nathan, to National Research Development Corporation. Method of forming reinforced plastics articles utilizing open-work tubes. 3,936,336, Cl. 156-86.000.

Phillips Petroleum Company: *See—*
Brady, Donnie G., 3,936,416.
Campbell, Robert W., 3,936,426.
Gray, Roy A., 3,936,420.
Keiser, LeRoy H., 3,936,582.
Reusser, Robert E., 3,936,387.
Rion, Pat F., 3,936,406.

Piccolo, Luigi; Calcagno, Benedetto; Ghirga, Marcello; and Paolinelli, Antonio, to Societa' Italiana Resine S.p.A. Compositions for use in agriculture as soil modifiers and their method of manufacture. 3,936,292, Cl. 71-63.000.
Pierson, Marvin B.: *See—*
Byrd, Fred; Pierson, Marvin B.; Compton, Thomas A.; and Dunbar, Frank C., 3,936,543.
Pietsch, Gunter W. E.: *See—*
Walter, Gerhard W. H.; and Pietsch, Gunter W. E., 3,936,057.
Pike, Russell E.: *See—*
Schwender, Charles F.; and Pike, Russell E., 3,936,457.
Pioneer Electronic Corporation: *See—*
Maruyama, Yoshio; Magata, Yoshihiro; Fushimi, Akihiro; Ueki, Yoshiharu; and Shimizu, Katsuhisa, 3,936,877.
Pipe Supports Limited: *See—*
Salter, Anthony John, 3,936,021.
Piro, Mario, to Nuova San Giorgio S.p.A. Pin insertion machine for needle selecting cylinders of circular knitting machines. 3,935,629, Cl. 29-208.00C.
Piscionere, Anthony G., Sr. Battery clamp. 3,936,134, Cl. 339-235.000.
Pitel, Irving; Silverman, Richard S.; and Mueller, Richard J., to Rowe International, Inc. Gun and mint delivery unit for helical feed merchandising machine. 3,935,966, Cl. 221-75.000.
Pitney-Bowes, Inc.: *See—*
Sette, Paul R.; and Storace, Anthony, 3,935,800.
Storace, Anthony; and Morabito, James, 3,936,114.
Tramposch, Herbert, 3,935,937.
Pittman, Allen G.: *See—*
Wasley, William L.; and Pittman, Allen G., 3,936,267.
Pittman, Paul F., to Westinghouse Electric Corporation. Insulation test apparatus including improved means for simultaneous display. 3,936,730, Cl. 324-54.000.
Plasko, Emil Robert, to Micro Devices Corporation. Electrical protection means. 3,936,702, Cl. 317-40.00A.
Playart Ltd.: *See—*
Tong, Duncan, 3,935,665.
Plew, Franklin T. Noisemaking device for use with fishing lure or bait and method of making same. 3,935,660, Cl. 43-42.310.
Ploetz, Theodor: *See—*
Kriebitz, Helmut; Ploetz, Theodor; and Westerhuis, Popko Julius, 3,936,544.
Plowman, Larry M.; and Lahaye, Thomas G., to Abitibi Corporation. Surface decoration of embossed or textured panel products. 3,936,541, Cl. 427-262.000.
Pluenneke, Ricks H.; and Dykes, Willis G., to Lasco Corporation. Apparatus for selectively applying electrical current to plants. 3,935,670, Cl. 47-1.300.
Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Pouilloux, Jacques, 3,935,894.
Pneumeric Corporation: *See—*
Hawley, Jack S., 3,935,795.
Podojil, James W., to Goodyear Tire & Rubber Company, The. Storage rack for unvulcanized pneumatic tires. 3,935,948, Cl. 211-23.000.
Pohl, Harold J.: *See—*
Cantwell, Robert Roger; and Pohl, Harold J., 3,935,607.
Polaroid Corporation: *See—*
Cardone, Paul A., 3,936,300.
Erlichman, Irving, 3,936,847.
Grasshoff, J. Michael; and Reid, Jerome L., 3,936,401.
Milligan, Terry W.; and Wright, Richard F., 3,936,357.
Morse, John B., 3,936,845.
Scholz, Donald T., 3,936,166.
Wareham, Richard R., 3,936,851.
Pollock, Donald M.; and Hallowell, Fulton W., to Consupak, Inc. Method for multiple blow molding with rotary turntable. 3,936,521, Cl. 264-98.000.
Pollock, E. Kears, to PPG Industries, Inc. Method and apparatus for selectively cooling glass during its advance along a molten metal surface. 3,936,289, Cl. 65-65.00A.
Pollutant Separation, Inc.: *See—*
Burnett, Henry J., 3,936,625.
Polzin, Dean A.; Trickey, Arthur J.; and Trickey, Arthur M. Tool for applying masking tape to moldings. 3,935,758, Cl. 81-3.00R.
Pommerening, Uwe A., to Stromberg-Carlson Corporation. Synchronization of clocks in digital signalling networks. 3,936,604, Cl. 178-69.50R.
Pommerening, Uwe A., to Stromberg-Carlson Corporation. Trunk transfer circuit. 3,936,615, Cl. 179-18.0AD.
Pond, David Martin; and Wang, Richard Hsu-Shien, to Eastman Kodak Company. Benzotriazole ortho-ester ultraviolet stabilizers and their use in organic compositions. 3,936,418, Cl. 260-45.8NT.
Poole, Margaret A., to GTE Sylvania Incorporated. Time compression scanner. 3,936,611, Cl. 179-15.55T.
Post Office, The: *See—*
Rollett, John Mortimer; and Wise, David Richard, 3,936,777.
Potrzuski, Stanley G.; and Potrzuski, Walter John. Electrical signal mechanism actuated in response to rotation about any of three axes. 3,935,669, Cl. 46-228.000.
Potrzuski, Walter John: *See—*
Potrzuski, Stanley G.; and Potrzuski, Walter John, 3,935,669.
Pottken, Wolfgang S.: *See—*
Harmsen, Ulf O.; and Pottken, Wolfgang S., 3,935,988.
Pouilloux, Jacques, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Tire having ends of carcass cords extending circumferentially in bead area. 3,935,894, Cl. 152-356.000.
Powell, Donald L., to Autoresearch Laboratories, Inc. Apparatus for determining the corrosion protection performance of a fluid. 3,936,273, Cl. 23-253.00C.
Pozzetto, Roberto: *See—*
Anselmino, Giovanni; Pozzetto, Roberto; and Carollo, Gianfranco, 3,936,684.
PPG Industries, Inc.: *See—*
Cerutti, Richard L.; and Demarest, Henry M., Jr., 3,936,290.
Hahn, Ernest A., 3,936,411.
Maaghul, John, 3,936,285.
Pollock, E. Kears, 3,936,289.
Sturni, Lance C.; and Bosso, Joseph F., 3,936,405.
Preiswerk, Martin: *See—*
Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, 3,936,479.
Prescott, Robert Frank, to United Kingdom Atomic Energy Authority. Nuclear reactors. 3,936,349, Cl. 176-78.000.
Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See—*
Scholfield, Richard P., 3,936,112.
Pretty, Frederick A., to USM Corporation. Apparatus for actuating a plurality of piston and cylinder assemblies. 3,935,778, Cl. 83-639.000.
Price, Ralph E., to Landis Tool Company. Machine tool fault indicator. 3,935,675, Cl. 51-105.0SP.
Prinoth, Ernesto. Vehicle chassis. 3,936,074, Cl. 280-106.00R.
Pritchard, William Stratton. Picture frame system. 3,935,656, Cl. 40-155.000.
Probst, Kendall D. Cycle shock absorber. 3,936,076, Cl. 280-276.000.
Procter & Gamble Company, The: *See—*
Baskerville, Ralph James, Jr.; and Schiro, Francis Gennaro, 3,936,537.
Zeffren, Eugene; and Turner, Jerry, 3,935,868.
Produits Findus S.A.: *See—*
Richardson, George Wilfred, 3,935,867.
Propper Manufacturing Company, Inc.: *See—*
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Protopapas, Donald G.: *See—*
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Prudhomme, Alain; and Kotcharian, Michel, to BSL Bignier Schmid Laurent. Support for welding head carriage. 3,935,985, Cl. 228-45.000.
Pukaite, Clifford Joseph, to Globe-Union Inc. Thick film variable resistor. 3,936,568, Cl. 428-333.000.
Pulver, Donald W. Method of solar heating and cooling. 3,935,897, Cl. 165-1.000.
Pupillo, Sam S.: *See—*
Williams, Alverson B.; Dolinski, Bolek J.; and Pupillo, Sam S., 3,935,674.
Putschky, Ernst, to ITT Industries, Inc. Electromagnetic valve. 3,936,030, Cl. 251-129.000.
Quaker Oats Company, The: *See—*
Tomomatsu, Hideo, 3,936,425.
Quality Steel Fabricators, Inc.: *See—*
Burch, Arthur Robert, 3,935,950.
Quin, Murray L.: *See—*
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R. E. Phelon Company, Inc.: *See—*
Donovan, John J.; and Isham, Daniel R., 3,935,852.
R & G Sloane Manufacturing Co., Inc.: *See—*
Blumenkranz, James J., 3,936,081.
Rabatin, Jacob G., to General Electric Company. Multi-layer X-ray screens. 3,936,644, Cl. 250-486.000.
Rabinowitz, Azriel Jay, to Sybron Corporation. Headrest for dental chair. 3,936,091, Cl. 297-188.000.
Radiologic Sciences, Inc.: *See—*
Iversen, Arthur H., 3,936,645.
Ragan, Ramon Wright: *See—*
Brenneman, Daniel Andrew; Ragan, Ramon Wright; and Brockie, Thomas Harry, 3,936,704.
Ramey, Chester E.; and Luzzi, John J., to Ciby-Geigy Corporation. Substituted piperazine dione oxyls and hydroxides and polymer compositions stabilized thereby. 3,936,456, Cl. 260-268.0DK.
Ramillon, Rene. Safety ski binding. 3,936,065, Cl. 280-11.35T.
Rampy, Gordon A.: *See—*
Terhune, F. Lee; and Rampy, Gordon A., 3,936,410.
Randazzo, Giacomino. Process for the preparation of polyaldehydes by polymerization of bifunctional monomers and related products. 3,936,423, Cl. 260-67.0UA.
Rank Xerox Ltd.: *See—*
Murakami, Shinichi, 3,936,179.
Smith, Vernon J.; Smith, Howard M.; Page, Bernard F.; and Miller, Laurence G., 3,936,042.
Ranzanigo, Pierluigi, to Bassani S.p.A. Cartridge fuse carrier assembly. 3,936,787, Cl. 337-228.000.
Rapp, James E., to Owens-Illinois, Inc. Semiconductive glass-ceramic articles. 3,936,397, Cl. 252-518.000.
Rathgeb, Paul; Tournayre, Jean Claude; and Vogel, Christian, to Ciba-Geigy Corporation. Method of selective weed control with certain chloroacetamides. 3,936,293, Cl. 71-118.000.
Rausing, Anders Ruben. Interlocking system with a number of individual key elements. 3,936,662, Cl. 235-61.12N.

Rausing, Ruben A., to Tetra Pak Developpement SA. Packing container. 3,935,968, Cl. 222-479.000.

Rawlins, Philip G.: *See—*
Lieder, Gaylerd; and Rawlins, Philip G., 3,936,043.

Ray, N. Reece, to Lockheed Aircraft Corporation. Radome test instrument. 3,936,736, Cl. 324-58.50R.

Raymond Lee Organization, Inc., The: *See—*
Connolly, Timothy J., 3,935,806.
Loftin, Wayne M., 3,935,856.
Martin, William F., 3,936,198.
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Benjamin, James A., 3,936,864.
Goldstone, Bertram J.; and Memishian, John, Jr., 3,936,820.
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RCA Corporation: *See—*
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Dingwall, Andrew Gordon Francis, 3,936,859.
Dorsey, Denis Peter; and Rodda, William E., 3,936,597.
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Sheng, Abel Ching Nam, 3,936,755.
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Redfield, Carl: *See—*
Lattari, Pasquale R.; and Redfield, Carl, 3,935,986.

Redpath Dorman Long Limited: *See—*
Marshall, Victor Gregory; and Thompson, John Maurice, 3,936,714.

Reehil, Edward G.: *See—*
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Regie Nationale des Usines Renault: *See—*
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Peltier, Henri; Catrain, Michel; and Monnin, Andre, 3,935,765.
Rivere, Jean-Pierre, 3,935,853.

Reginato, Luigi; Bienfait, Charles; and Stevens, Jacques, to Solvay & Cie. Process for the polymerization of olefins and catalytic products. 3,936,431, Cl. 260-88.20R.

Reid, Jerome L.: *See—*
Grasshoff, J. Michael; and Reid, Jerome L., 3,936,401.

Reine, Marion B.; and Rotolante, Ralph A., to Honeywell Inc. Thermally stimulated detrapping of charged carriers in cryogenic photoconductive material. 3,936,637, Cl. 250-352.000.

Reinke, Richard F. Irrigation pivot stand construction. 3,936,117, Cl. 339-8.00R.

Reinsch, Arnold O. Winfried. Applicator drive unit. 3,935,869, Cl. 132-9.000.

Reintjes, John Francis, Jr.; and Wynne, James Jeffrey, to International Business Machines Corporation. Single laser cavity for generating TE or TM modes. 3,936,770, Cl. 331-94.50C.

Reischl, Norbert M. Automobile frame and body repairing apparatus. 3,935,725, Cl. 72-451.000.

Reiter, Herbert, to Siemens Aktiengesellschaft. Electronic overcurrent protection of a DC data transmission circuit. 3,936,700, Cl. 317-22.000.

Rem Die Casting, Inc.: *See—*
Cianciolo, Joseph; and McGargal, Robert E., 3,936,158.

Renal Systems, Inc.: *See—*
Massie, Harold Lee; and Cosentino, Louis C., 3,935,876.

Resco, Inc.: *See—*
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Respiratory Care, Inc.: *See—*
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Reusser, Robert E., to Phillips Petroleum Company. Azeotrope of 1,2-dichloro-1-fluoroethane and methanol. 3,936,387, Cl. 252-171.000.

Revesz, Robert N.: *See—*
Sitek, George J.; Revesz, Robert N.; and Berk, Charles W., 3,936,587.

Reynolds, Frank J.: *See—*
Luongo, Albert Michael; Reynolds, Frank J.; and Ruetsch, Rudolph R., 3,935,730.

Reynolds, Hugh M.: *See—*
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Rhoades-Brown, John Ernest: *See—*
Lloyd, Geoffrey Oliver; Rhoades-Brown, John Ernest; and Saunders, Stuart Richard John, 3,936,583.

Rhone-Poulenc S.A.: *See—*
Dumoulin, Jean; and Linguenheld, Louis, 3,936,578.
Sagi, Ferenc; and Roussos, Michel, 3,936,482.

Rhone-Progil: *See—*
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Rich, Leonard G.: *See—*
Gerber, Heinz Joseph; Logan, David J.; and Rich, Leonard G., 3,936,712.

Richards, Mildred C.: *See—*
Samour, Carlos M.; and Richards, Mildred C., 3,936,492.

Richardson, George Wilfred, to Produits Findus S.A. Stripping of Brussels sprouts from their stems. 3,935,867, Cl. 130-30.00R.

Richardson, John G.: *See—*
Willard, Charles F.; Marsden, Brian D.; Richardson, John G.; and Gastonguay, James L., 3,936,180.

Richardson, Josephine M. Portable podium. 3,936,109, Cl. 312-223.000.

Ricketts, James B., Jr.; Hehs, William A.; Auman, John T.; and Schlax, Timothy R., to General Motors Corporation. Steering system monitoring apparatus and procedure. 3,936,071, Cl. 280-95.00R.

Ricoh Co., Ltd.: *See—*
Ariyama, Kenzo, 3,936,045.
Shiinz Toshio; Yaejima, Masao; Sekiya, Tadayuki; and Bando, Toshiro, 3,936,041.

Ridings, Charles Luther: *See—*
Bringol, Charles Ronald; Lowry, Denis Earl; and Ridings, Charles Luther, 3,936,805.

Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Drive and bearing assembly for a converter construction. 3,936,098, Cl. 308-6.00R.

Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Bearing assembly for accommodating angular displacements in torque-transmitting trunnions. 3,936,102, Cl. 308-72.000.

Riet, John C., to International Harvester Company. Coupling assembly for multiple implements. 3,935,907, Cl. 172-314.000.

Rinck, Hans-Joachim. Apparatus for checking the level of liquid in containers. 3,935,835, Cl. 116-118.00R.

Rion, Pat F., to Phillips Petroleum Company. Stable emulsions. 3,936,406, Cl. 260-29.7GP.

Riparbelli, Carlo, to General Dynamics Corporation. Penetrating spear. 3,935,817, Cl. 102-52.000.

Rist's Wires and Cables Limited: *See—*
Ball, Lewis John; Smith, Gordon Roy Frank; and Fry, William Lawrence, 3,936,344.

Ritter, Gerhard; Ritter, Josef; Ritter, Klaus; Boyer, Wilhelm; and Gott, Hans, to EVG Entwicklungs- u. Verwertungsgesellschaft m.b.H. Apparatus for forming elongate reinforcing elements. 3,936,628, Cl. 219-56.000.

Ritter, Josef: *See—*
Ritter, Gerhard; Ritter, Josef; Ritter, Klaus; Boyer, Wilhelm; and Gott, Hans, 3,936,628.

Ritter, Klaus: *See—*
Ritter, Gerhard; Ritter, Josef; Ritter, Klaus; Boyer, Wilhelm; and Gott, Hans, 3,936,628.

Rivere, Jean-Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Internal combustion engine cold-start fuel injector. 3,935,853, Cl. 123-179.00G.

Rizzo, Frank: *See—*
Kelly, John F.; and Rizzo, Frank, 3,936,673.

Robert Bosch G.m.b.H.: *See—*
Brill, Klaus; and Glassman, Christian, 3,936,545.

Robert Olson, a/k/a John R. Olson: *See—*
Bawden, Ralph D.; and Robert Olson, a/k/a John R. Olson, 3,935,832.

Robertshaw Controls Company: *See—*
Caldwell, Edward N., 3,935,998.
Genbauff, Francis S., 3,935,626.
Hardin, George T., 3,935,875.
Hardin, George T., 3,936,717.

Robilliart, Michel: *See—*
Ardry, Robert; and Robilliart, Michel, 3,936,434.

Robins, Sy Raymond. Production of belgium endive. 3,935,673, Cl. 47-58.000.

Robinson, Brian W.: *See—*
Miller, William A.; and Robinson, Brian W., 3,936,569.

Robinson, David Phythian, to U.S. Philips Corporation. Semiconductor devices having conductor tracks at different levels and interconnections therebetween. 3,936,865, Cl. 357-68.000.

Roch, Jacques L., to Electroglas, Inc. High speed precision chuck assembly. 3,936,743, Cl. 324-158.00F.

Rocholl, Martin-Gottfried, to Teroson GmbH. Thermosetting sealing materials. 3,936,412, Cl. 260-37.00R.

Rockford Headed Products, Inc.: *See—*
Lathom, Paul R., 3,935,785.

Rockford Servo Corporation: *See—*
Hickey, Thomas L., 3,935,979.

Rockwell International Corporation: *See—*
Cumming, James C., 3,936,096.
Haerther, Lester W.; and Kammerer, Leo P., 3,936,798.
Weber, Charles A., 3,936,823.

Rodda, William E.: *See—*
Dorsey, Denis Peter; and Rodda, William E., 3,936,597.

Roe, Robin D.: *See—*
Guppy, John R.; and Roe, Robin D., 3,936,603.

Roesch, Eduard, to Dixi S.A. Device for determining the position of a structural element. 3,936,195, Cl. 356-170.000.

Rohm and Haas Company: *See—*
Lesnik, Jack Vender, 3,935,698.

Rohr, Wolfgang; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted sulfonylglycolic acid anilides. 3,936,485, Cl. 260-456.00A.

Rohrer, Wesley M.: *See—*
Wachter, William J.; and Rohrer, Wesley M., 3,936,348.

Rollett, John Mortimer; and Wise, David Richard, to Post Office, The. Arrangements for simulating inductance and filter networks incorporating such improvements. 3,936,777, Cl. 333-80.00R.

Rolls-Royce (1971) Limited: *See—*
Fuller, John Rodney Dyson, 3,936,218.

Ronden, Clifford Paul, to Grandview Industries, Limited. Coilable polyvinyl chloride products and methods and compositions for producing the same. 3,936,417, Cl. 260-42.450.

Rookus, James E. Sharpener for electric shavers. 3,935,638, Cl. 30-37.000.

Rorand (Proprietary) Limited: *See—*
Rowe, Alexander W., 3,936,553.

Rosen, Robert, to United States of America, Navy. D.C. restorer circuit. 3,936,760, Cl. 328-162.000.

Rosenkranz, Hans-Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, to Bayer Aktiengesellschaft. Photopolymerizable polymer based on an etherified polyhydroxyalkyl acrylate. 3,936,428, Cl. 260-78.50T.

Rosenthal, Rudolph; and Zajacek, John G., to Atlantic Richfield Company. Production of isocyanates from substituted ureas. 3,936,484, Cl. 260-453.00P.

Ross, Joseph A.: *See—*
Di Matteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 3,936,649.

Roth, Paul. Device for baring insulated electrical conductor wire and stranded wire. 3,935,759, Cl. 81-9.510.

Roth, Walter, to Diagnostic Instruments, Inc. Oriented photoemitters. 3,936,529, Cl. 427-36.000.

Roto Diesel: *See—*
Bonin, Jean-Claude, 3,936,233.

Rotolante, Ralph A.: *See—*
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Roussos, Michel: *See—*
Sagi, Ferenc; and Roussos, Michel, 3,936,482.

Rowe, Alexander W., to Rorand (Proprietary) Limited. Insulating materials. 3,936,553, Cl. 428-81.000.

Rowe International, Inc.: *See—*
Pitel, Irving; Silverman, Richard S.; and Mueller, Richard J., 3,935,966.

Roy, Richard M. Shock absorber spring changing tool. 3,935,630, Cl. 29-227.000.

Rozsa, Laszlo; Meszaros, Lajos; and Magyorodi, Ferenc, to Eszakmagyarorszagi Vegyimuvek. Process and equipment for solvent extraction. 3,936,489, Cl. 260-463.000.

Rubin, Howard: *See—*
Keegan, James J.; Patel, Girish; and Rubin, Howard, 3,936,402.

Rubin, Irene E., to Rubin, Irene E. Illuminated vehicular display sign. 3,935,654, Cl. 40-129.00C.

Rudolph, Hans: *See—*
Rosenkranz, Hans-Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, 3,936,428.

Ruell, Hartwig, to Siemens Aktiengesellschaft. Arrangement for sequential data storage. 3,936,140, Cl. 350-3.500.

Ruetsch, Rudolph R.: *See—*
Luongo, Albert Michael; Reynolds, Frank J.; and Ruetsch, Rudolph R., 3,935,730.

Rumsey, Rollin Douglas. Radial piston pump/motors. 3,935,794, Cl. 91-488.000.

Russell, Anthony William. Directional drilling of bore holes. 3,935,642, Cl. 33-302.000.

Russell, Anthony William: *See—*
Russell, Michael King; and Russell, Anthony William, 3,935,643.

Russell, Michael King; and Russell, Anthony William. Methods of and means for measuring angles. 3,935,643, Cl. 33-312.000.

Russell, Richard H.: *See—*
Hildebrandt, William J.; and Russell, Richard H., 3,935,779.

Ryan, Wilma: *See—*
Maher, William A., 3,936,252.

Rybak, Boris. Low-inertia hygrometer. 3,935,742, Cl. 73-336.500.

S.A.R.L. Sud est Electro Mecanique S.E.E.M.: *See—*
Monnet, Francois, 3,935,732.

Sadamatsu, Shigeru, to Fuji Xerox Co., Ltd. Electrophotographic copying machine with improved cleaning blade. 3,936,183, Cl. 355-15.000.

Saeki, Keiso: *See—*
Miyazawa, Yoshihide; Ozutsumi, Minoru; Ogawa, Satoshi; Saeki, Keiso; and Watanabe, Akio, 3,936,564.

Sagi, Ferenc; and Roussos, Michel, to Rhone-Poulenc, S.A. Organo tin compounds useful as catalysts in the polycondensation of organosilicon compounds. 3,936,482, Cl. 260-429.700.

Saito, Minoru: *See—*
Hirai, Masahide; Fujimura, Mikio; Kazigase, Masahiro; and Saito, Minoru, 3,936,399.

Sakaguchi, Fumio; Takemura, Kenji; Suzuki, Tadao; Yamazaki, Isamu; Nishibayashi, Yoshifumi; Shiozawa, Kazunobu; and Sasaki, Toshimitsu, to Showa Denko Kabushiki Kaisha; and Toyo Cloth Co., Ltd. Synthetic resin composition. 3,936,403, Cl. 260-23.0XA.

Sakshaug, Eugene C., to General Electric Company. Gas-insulated electric power apparatus including a surge arrester with hot gas relief means. 3,936,703, Cl. 317-62.000.

Sakurai, Yoshifumi: *See—*
Sawai, Yukio; Sakurai, Yoshifumi; and Terata, Hiroshi, 3,935,711.

Salgo, Francis John, to Butler, Binion, Rice, Cook & Knapp. Mobile ion film memory. 3,936,690, Cl. 313-392.000.

Saltarelli, Cora G. Method of separating and scanning organic cells and molecules. 3,936,272, Cl. 23-230.00B.

Salter, Anthony John, to Pipe Supports Limited. Pipe supports. 3,936,021, Cl. 248-54.0CS.

Samama, Lydie Esther, administratrix: *See—*
Viout, Andre; Esanu, David, deceased; and Samama, Lydie Esther, administratrix, 3,936,427.

Samour, Carlos M.; and Richards, Mildred C., to Kendall Company, The. Monomeric emulsion stabilizers. 3,936,492, Cl. 260-482.00R.

Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 3,936,453.
Hughes, Philip A., 3,936,674.

Sandoz Ltd., (Sandoz AG): *See—*
Allan, Zdenek; and Schweizer, August, 3,936,496.
Avar, Lajos; Hofer, Kurt; and Preiswerk, Martin, 3,936,479.

Sandvik Aktiebolag by change of name from Sandvikens, Jernverks Aktiebolag: *See—*
Alfredsson, Stig Allan Junior, 3,936,873.

Sango Company, Limited: *See—*
Sato, Masami, 3,935,775.

Sano, Reiji: *See—*
Asakawa, Shirow; Hasegawa, Katsue; Sano, Reiji; and Matsuda, Shunsuke, 3,936,307.

Sansanelli, Edward, to Airwick Industries, Inc. Container and hanger clip therefor. 3,935,956, Cl. 215-100.00R.

Santurri, Pasco R.; Mumm, Howard W.; and Yockey, Thomas E., to Orchard Corporation of America, The. Self-sealable corrosion protectable packaging material and method of making. 3,936,560, Cl. 428-219.000.

Sasabe, Kaoru; Kotera, Hiroaki; Hane, Toshihide; Kihara, Nobuyoshi; and Takebe, Masao, to Matsushita Electric Industrial Co., Ltd. Device for presetting a television program and the like. 3,936,752, Cl. 325-396.000.

Sasajima, Kikuo: *See—*
Yamamoto, Hisao; Nakao, Masaru; Sasajima, Kikuo; Maruyama, Isamu; and Katayama, Shigenari, 3,936,468.

Sasaki, Toshimitsu: *See—*
Sakaguchi, Fumio; Takemura, Kenji; Suzuki, Tadao; Yamazaki, Isamu; Nishibayashi, Yoshifumi; Shiozawa, Kazunobu; and Sasaki, Toshimitsu, 3,936,403.

Sasase, Naoshi: *See—*
Kuwako, Tomohisa; Tanase, Toshio; and Sasase, Naoshi, 3,936,680.

Saterdal, Edgar, to Aktiebolaget Svenska Flaktfabriken. Method of manufacturing axial fans of different sizes. 3,935,625, Cl. 29-156.80R.

Sato, Akio: *See—*
Arimura, Iwao; Suzuki, Yasuo; Matsuda, Akira; and Sato, Akio, 3,935,892.

Sato, Atsushi; Aida, Yoshiaki; and Shimizu, Isoo, to Nippon Petrochemicals Company Ltd. Pressure sensitive record material employing diaryl alkane solvents. 3,936,566, Cl. 428-323.000.

Sato, Goro, to Hokuetsu Kogyo Co., Ltd. Rotary compressor of oil cooling type with appropriate oil discharge circuit. 3,936,249, Cl. 418-88.000.

Sato, Hideki: *See—*
Ishizawa, Toshitugu; Akahori, Motokazu; and Sato, Hideki, 3,935,842.

Sato, Hiroshi, to Fuji Xerox Co., Ltd. Method and apparatus for generating character patterns. 3,936,664, Cl. 235-151.000.

Sato, Masami, to Sango Company, Limited. Iron piece shearing machine. 3,935,775, Cl. 83-355.000.

Sato, Setsuo, to Aoi Sansho Kabushiki Kaisha. Optical fibre end connector. 3,936,143, Cl. 350-96.00C.

Satomi, Takeo; Mukai, Kunio; Mine, Akihiko; Hino, Naganori; Tateishi, Kohshi; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. O-Ethyl-O-(3-methyl-6-nitrophenyl)-n-secondary butyl-phosphoronthionamidate. 3,936,433, Cl. 260-954.000.

Satomura, Masato: *See—*
Seoka, Yoshio; Satomura, Masato; and Umehara, Akira, 3,936,429.

Satzinger, Gerhard: *See—*
Hartenstein; Satzinger, Gerhard; and Herrmann, Manfred, 3,936,438.

Saunders, Frank L.; and Pelletier, Ronald R., to Dow Chemical Company, The. Radiation crosslinked block copolymer blends with improved impact resistance. 3,936,365, Cl. 204-159.200.

Saunders, Stuart Richard John: *See—*
Lloyd, Geoffrey Oliver; Rhoades-Brown, John Ernest; and Saunders, Stuart Richard John, 3,936,583.

Sawabe, Eiichi: *See—*
Yanagimachi, Akio; Uehara, Takashi; Yamamoto, Tetsuo; Yamane, Hisakichi; Sawabe, Eiichi; Yoshino, Takehiko; Takezawa, Teruhiro; Masuda, Michio; Nabeyama, Hiroaki; Fukuda, Masaaki; and Kayano, Tatsuo, 3,936,595.

Sawada, Teruho; Hirayama, Takeshi; and Kokubo, Kenzo, to Nippon Paint Company Ltd. Apparatus for the continuous manufacture of polymer plates. 3,936,254, Cl. 425-89.000.

Sawai, Yukio; Sakurai, Yoshifumi; and Terata, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Flap gate. 3,935,711, Cl. 61-25.000.

Sawyer, Baldwin, to Sawyer Research Products, Inc. Color sorting of irradiated materials and a calibrated color comparison array. 3,936,188, Cl. 356-36.000.

Sawyer Research Products, Inc.: *See—*
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Saxe, Van Rensselaer P. Trash can protector. 3,935,964, Cl. 220-318.000.

Scanlon, J. Philip: *See—*
Allen, Douglas, Jr.; Caffrey, Richard F.; and Scanlon, J. Philip, 3,935,596.

Schaar, Charles H., to Colgate-Palmolive Company. Method of making a disposable diaper. 3,935,768, Cl. 83-39.000.

Schagen, Pieter; and Stubberfield, Pamela May, to U.S. Philips Corporation. Photocathode with plurality of concentric conducting rings. 3,936,687, Cl. 313-101.000.

Schallis, Alvin H., to Stauffer Chemical Company. Process for producing free flowing particulate sulfur. 3,936,534, Cl. 427-215.000.

Scharfe, Gerhard: *See—*
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Schiel, Douglas W., to Paccar Inc. Grille system for tilt cab truck. 3,935,920, Cl. 180-89.00A.

Schiff, Robert: *See—*
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Schiffman, Murray M., to Cambridge Research and Development Group; Greenberg, Sanford D.; DT Liquidating Partnership; and Schiffman, Murray M. Dual delay line storage sound signal processor. 3,936,610, Cl. 179-15.55T.

Schild, Josef, to Vockenhuber, Karl; and Hauser, Raimund. Film camera. 3,936,168, Cl. 352-209.000.

Schindler, Earle R., to Resco, Inc. Electronic transmission dynamometer. 3,935,733, Cl. 73-136.00A.

Schiro, Francis Gennaro: *See—*
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Schlax, Timothy R.: *See—*
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Schmidt, Albert Leo. Flapper flush valve. 3,935,598, Cl. 4-57.00P.

Schmidt, Manfred: *See—*
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Riegler, Ernst; and Schmidt, Manfred, 3,936,102.

Schmidt, Robert C., to Varian Associates. Electron collector having means for trapping secondary electrons in a linear beam microwave tube. 3,936,695, Cl. 315-3.500.

Schmidt, Uwe; and Chvatlinsky, Kurt, to Olympia Werke AG. Automatic threading of a typing ribbon. 3,935,939, Cl. 197-175.000.

Schnee, Karl; Tichy, Dieter; Michel, Walter; and Gruber, Gunter, to Cassella Farbwerke Mainkur Aktiengesellschaft. Process of preparing melamine resin films by impregnation of paper, cellulose, fleece or fabric. 3,936,547, Cl. 427-390.000.

Schneider, Herbert Anton, to Bell Telephone Laboratories, Incorporated. Current mirrors. 3,936,725, Cl. 323-1.000.

Schneider, Martin Victor, to Bell Telephone Laboratories, Incorporated. Process for contact photolithography utilizing a photomask having indented channels. 3,936,301, Cl. 96-36.000.

Schneider, Roy W.: *See—*
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Schnell, Karl. Perforated plate for crushing machines. 3,936,005, Cl. 241-83.000.

Schoen, Lowhardt A. A.; Visseren, Marinus J. R.; and van der Sangen, Jean G., to Stamicarbon N.V. Process for the preparation of halogen-carrying rubberlike copolymers. 3,936,430, Cl. 260-80.780.

Scholfield, Richard P., to Presto Lock Company, Division of Walter Kidde & Company, Inc. Cradle selector controls for motorized rotary files. 3,936,112, Cl. 312-267.000.

Scholz, Donald T., to Polaroid Corporation. Multipurpose audio-visual cassette method. 3,936,166, Cl. 352-38.000.

Schriesheim, Alan: *See—*
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Schrock, Martin Omer; and Dibbern, John Earl, Jr., to Black and Decker Manufacturing Company, The. Linear motor cooling fan. 3,936,242, Cl. 417-417.000.

Schrock, Wilfried: *See—*
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Schroeder, Herbert M.; and Stievater, Paul C., to Textron, Inc. Ureaurethane compositions and films prepared therefrom. 3,936,409, Cl. 260-30.200.

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Schubert, John C.; Cyr, Steven; and Case, Charles B., to Standard Oil Company. Container. 3,935,962, Cl. 220-306.000.

Schubin, Mark; and Andersen, George, to Lincoln Center for the Performing Arts, Inc. Secure television system. 3,936,594, Cl. 178-5.100.

Schukin, Alexei Alexeevich: *See—*
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Schwartz, Bernard: *See—*
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Schweizer, Gottfried, to Gertsch AG. Ski binding. 3,936,062, Cl. 280-11.35D.

Schwender, Charles F., to Warner-Lambert Company. 5-Amino-4-chloro-6-(substituted amino)-pyrimidines. 3,936,454, Cl. 260-256.40N.

Schwender, Charles F.; and Pike, Russell E., to Warner-Lambert Company. Substituted 9-benzylacridines. 3,936,457, Cl. 260-279.00R.

Schwender, Charles F.; and Shavel, John, Jr., to Warner-Lambert Company. Substituted 4-benzylquinolines. 3,936,461, Cl. 260-289.00R.

Scientific Anglers, Inc.: *See—*
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Scott, Rocco A., to Michaelson, Joseph B. Golf practice device. 3,936,055, Cl. 273-176.00H.

Scott, Warner Curtis, to Texas Instruments Incorporated. Charged particle beam scanning device. 3,936,697, Cl. 315-12.00R.

Scribner, William N. Swimming pool. 3,935,600, Cl. 4-172.130.

Secretary of State for Trade & Industry in Her Britannic Majesty's Govt. of U.K. of Gt. Britain & Northern Ireland: *See—*
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Seilly, Alec Harry; and Scott, Kenneth Clive, to Simms Group Research & Development Limited. Weighing device. 3,935,915, Cl. 177-136.000.

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Senor, Ronald E.; and Trenkler, George, to Texas Instruments Incorporated. Circuit breaker apparatus. 3,936,792, Cl. 337-85.000.

Sentrol Systems Ltd.: *See—*
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Sett:, Paul R.; and Storace, Anthony, to Pitney-Bowes, Inc. Flap separating mechanism. 3,935,800, Cl. 93-61.00R.

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Shanklin, Dunbar L. Fibrous blanket containing solder flux and solder flux with increased melted viscosity. 3,936,325, Cl. 148-26.000.

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Shaver, J. Lyle: *See—*
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Shaw, David N., to Dunham-Bush, Inc. Undercompression and overcompression free helical screw rotary compressor. 3,936,239, Cl. 417-315.000.

Shaw, Jerry; and Solitt, Samuel G. Jewelry display and viewing device. 3,936,156, Cl. 350-235.000.

Sheikh, Sikander, to Xerox Corporation. Control arrangement for an electrostatographic reproduction apparatus. 3,936,182, Cl. 355-14.000.

Shell Oil Company: *See—*
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Shen, Jacob: *See—*
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Shiba, Keisuke; Kubodera, Seiiti; Naito, Hideki; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Photographic photosensitive element and developing method thereof. 3,936,303, Cl. 96-74.000.

Shibano, Hiroshi; and Isao, Iizaka, to Minolta Camera Kabushiki Kaisha. Elastic electroconductive product. 3,936,170, Cl. 355-3.00R.

Shibano, Naoki: *See—*
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Shibata, Mituo. Anchoring device and method for settling the device in the ground. 3,935,912, Cl. 175-264.000.
Shibayama, Kimio; and Yamanouchi, Kazuhiko, to Kimio Shibayama. Elastic surface wave transducer. 3,936,679, Cl. 310-9.800.
Shiber, Samuel. Airplane's anti-wheel-lock and spin-up system. 3,936,016, Cl. 244-103.00S.
Shiina, Toshio; Yaejima, Masao; Sekiya, Tadayuki; and Bando, Toshiro, to Ricoh Co., Ltd. Automatic original supply device for electronic copying apparatus. 3,936,041, Cl. 271-4.000.
Shikishima Tipton Mfg. Co., Ltd.: *See—*
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Shim, Kyung S., to Stauffer Chemical Company. Polyalkylene glycol vinyl phosphates. 3,936,514, Cl. 260-929.000.
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Shinnick, David M.: *See—*
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Simpson, Kenneth, to Raymond Lee Organization, Inc., The, a part interest. Illuminated bladder buoy. 3,935,658, Cl. 43-17.500.
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Sittmann, Brigitte, to Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH. Retaining mechanism for ski bindings. 3,936,063, Cl. 280-11.35P.
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Smith, Vernon J.; Smith, Howard M.; Page, Bernard F.; and Miller, Laurence G., to Rank Xerox Ltd. Sheet feeding devices. 3,936,042, Cl. 271-9.000.
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Solis, Frank. Compact gas purifier. 3,936,283, Cl. 55-230.000.
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Soot, Olaf. Modular planter panel system. 3,935,671, Cl. 47-34.00R.
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Staar, Theophiel Clement Jozef Lodewijk, to Staar, S.A. Tape cassette transport. 3,936,011, Cl. 242-198.000.
Staats, James E., to General Electric Company. Magnetron with capacitively coupled external cavity resonator. 3,936,766, Cl. 331-88.000.
Stach, Paul E.; and Sherrin, Thomas P. Syringe filling apparatus with disposable fluid conducting elements. 3,935,883, Cl. 141-27.000.
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Staver Company, Incorporated, The: *See—*
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Stedman, Robert N., to Caterpillar Tractor Co. Implement mounting means for earthworking vehicles. 3,935,953, Cl. 214-145.00A.
Steinhagen, Carl A.: *See—*
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Steinmetz, Walter Edmund, to Pennzoil Company. Anti-caking of potassium bisulfate and resulting compositions. 3,936,392, Cl. 252-385.000.
Stemmler, Heinz: *See—*
Stemmler, Mathias; and Stemmler, Heinz, 3,936,312.
Stemmler, Kurt; and Ehlscheid, Gunter, to Winkler & Dunnebier. Apparatus for making envelopes with broad or pointed closures from a paper web. 3,935,799, Cl. 93-61.00R.
Stemmler, Mathias; and Stemmler, Heinz. Composition for the preparation of coatings on meat and sausage goods. 3,936,312, Cl. 106-171.000.
Stenudd, Sven Gunnar Valter, to Facit Aktiebolag. Direction of movement sensing device for a perforated code carrier tape. 3,936,650, Cl. 250-571.000.
Stephany, Joseph F.: *See—*
Haas, Werner E. L.; and Stephany, Joseph F., 3,936,640.
Sterling Drug Inc.: *See—*
Albertson, Noel F., 3,936,462.
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Stern, Howard K.: *See—*
Di Matteo, Paul L.; Ross, Joseph A.; and Stern, Howard K., 3,936,649.
Steven, Gary, to Crucible Inc. Method for producing tool steel articles. 3,936,299, Cl. 75-224.000.
Stevens, Clyde Bennett, to General Signal Corporation. Hydraulic control system. 3,935,706, Cl. 60-444.000.
Stevens, Clyde Bennett: *See—*
Murphy, Eugene Scott; and Stevens, Clyde Bennett, 3,935,707.
Stevens, Jacques: *See—*
Reginato, Luigi; Bienfait, Charles; and Stevens, Jacques, 3,936,431.
Stevens, Robert B., to Stevens & Thompson Paper Company. Toilet tissue dispenser. 3,935,965, Cl. 221-48.000.
Stevens & Thompson Paper Company: *See—*
Stevens, Robert B., 3,935,965.
Stevenson, Hildreth W.: *See—*
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Sticha, James A. Highway color code marking. 3,936,207, Cl. 404-14.000.
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Stjernstrom, Bo Gustaf, to ITT Industries, Inc. Diagonal impeller pump. 3,936,225, Cl. 415-207.000.
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Meyer, Melvin H.; Vickers, James L.; Waycie, Edmund A.; and Weitzel, Gerald, 3,935,943.
Storace, Anthony; and Morabito, James, to Pitney-Bowes, Inc. Postage meter mounting fixture. 3,936,114, Cl. 312-311.000.
Storace, Anthony: *See—*
Sette, Paul R.; and Storace, Anthony, 3,935,800.
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Strekopytov, Alexei Alexeevich: *See—*
Akopov, Ernest Mikhailovich; Kapitanov, Nikolai Nikolaevich; Strekopytov, Alexei Alexeevich; Ogoltsova, Evgenia Sergeevna; and Paches, Alexandr Ilich, 3,935,981.
Striegler, Hellmut: *See—*
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Suntop, Morris A., 3,936,614.
Stubberfield, Pamela May: *See—*
Schagen, Pieter; and Stubberfield, Pamela May, 3,936,687.
Studer, Arnold David. Fecal examination device. 3,936,373, Cl. 209-17.000.
Sturm, Elmar; and Vogel, Christian, to Ciba-Geigy Corporation. Substituted 2-azabicycloalkanes as selective herbicides. 3,936,458, Cl. 260-283.00S.
Sturmer, David Michael: *See—*
Gaugh, Wilbur Seth; Heseltine, Donald Warren; Sturmer, David Michael; and Freeman, John Paul, 3,936,308.
Sturni, Lance C.; and Bosso, Joseph F., to PPG Industries, Inc. Novel pigment grinding vehicles. 3,936,405, Cl. 260-29.2EP.
Sucov, Eugene W.; and Weaver, Leiland A. C., to Westinghouse Electric Corporation. High flow metal halide vapor laser. 3,936,772, Cl. 331-94.50G.
Sudoldenburger Tierfrischmehl-Anlagengesellschaft: *See—*
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Sugahara, Yujiro: *See—*
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Sugimoto, Yukio; Okamasa, Makoto; and Fukumura, Toyoshi, to Matsushita Electric Industrial Co., Ltd. Four-channel stereophonic reproducing system for reproducing discrete CD-4 four-channel stereo disc. 3,936,619, Cl. 179-100.4ST.
Suhara, Manabu: *See—*
Oda, Yoshio; Uchida, Keiichi; Suhara, Manabu; and Morimoto, Takeshi, 3,936,505.
Suling, Carlhans; Theidel, Hans; Striegler, Hellmut; and von Langenthal, Wolfram, to Bayer Aktiengesellschaft. Marking of articles. 3,936,556, Cl. 428-195.000.
Suling, Carlhans: *See—*
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Sulkowski, Theodore S.; and Mascitti, Albert A., to American Home Products Corporation. (Hexahydrobenzimidazol-2-yl)benzophenones and derivatives. 3,936,471, Cl. 260-309.600.
Sullivan, Alan P., Jr., to Merck & Co., Inc. Purification process. 3,936,495, Cl. 260-501.120.
Sumitomo Bakelite Company, Limited: *See—*
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Sundeen, Joseph E.: *See—*
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Sundquist, John Robert, to Bell Telephone Laboratories, Incorporated. Interspersed double winding helical resonator with connections to cavity. 3,936,776, Cl. 333-73.00R.

Sundstrand Corporation: *See—*
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Sundstrand Data Control, Inc.: *See—*
Bateman, Charles Donald, 3,936,796.

Suntop, Morris A., to Stromberg-Carlson Corporation. PBX ground start trunk interface for station carrier systems. 3,936,614, Cl. 179-16.0EC.

Surgical Design Corporation: *See—*
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Suzuki, Mitsuru: *See—*
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Suzuki, Tadao: *See—*
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Swanson, Gunnar E., to Nielsen Hardware Corporation, The. Catch with anti-release latch. 3,936,082, Cl. 292-113.000.

SWF Machinery, Inc.: *See—*
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SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See—*
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Swiatlowski, Gerald G., to Leco Corporation. Metallographic polisher with speed control. 3,935,677, Cl. 51-134.50R.

Swick, Edwin Grant: *See—*
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Sybron Corporation: *See—*
Rabinowitz, Azriel Jay, 3,936,091.
Whitney, John Butler, 3,935,740.

Symann, Heinz-Georg, to Kupplungstechnik GmbH. Shaft coupling. 3,935,716, Cl. 64-13.000.

Symbol, Paul P. Boat Propeller. 3,936,228, Cl. 416-176.000.

Symon, Ted; and Christensen, Nils J., to Universal Oil Products Company. Vinylation of aromatic compounds. 3,936,473, Cl. 260-343.20R.

Syntex Corporation: *See—*
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Tabara, Yoshijiro; Akiyama, Hiroshi; Igawa, Masayuki; Maekawa, Tadashi; and Shinomiya, Tokuo, to Mitsubishi Rayon Co., Ltd. Process for manufacturing a synthetic microflake aggregate. 3,936,512, Cl. 260-897.00A.

Tahara, Yukio: *See—*
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Takada, Hisao: *See—*
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Takahashi, Kunihoiro: *See—*
Aya, Norimoto; Takahashi, Kunihoiro; Osaka, Kenji; and Kusunose, Naohito, 3,936,090.

Takahashi, Nobuaki; Onoye, Hideo; Muraoka, Teruo; and Kasuga, Masao, to Victor Company of Japan, Limited. Multichannel record disc reproducing system and apparatus. 3,936,618, Cl. 179-100.4ST.

Takami, Yasuji; Fukuda, Kenji; and Yamazaki, Eiichi, to Hitachi, Ltd. Method for manufacturing fluorescent screens for use in colour picture tubes. 3,936,302, Cl. 96-36.100.

Takano, Hiroshi: *See—*
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Takatori, Yasushi; and Nakazawa, Mitsunobu. Image recording member. 3,936,361, Cl. 204-2.000.

Takebe, Masao: *See—*
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Takeda Chemical Industries, Ltd,: *See—*
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Takemura, Kenji: *See—*
Sakaguchi, Fumio; Takemura, Kenji; Suzuki, Tadao; Yamazaki, Isamu; Nishibayashi, Yoshifumi; Shiozawa, Kazunobu; and Sasaki, Toshimitsu, 3,936,403.

Takeshita, Toru; and Ishimoto, Sachio, to Teijin Limited. Process for the preparation of desmosterol derivatives. 3,936,478, Cl. 260-397.200.

Takeuchi, Yuko: *See—*
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Takeya, Gen: *See—*
Ueda, Shigeru; Nakata, Yoshinori; Yokoyama, Shinichi; Todo, Naoyuki; Yoshida, Yuji; Ishii, Tadao; and Takeya, Gen, 3,936,371.

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Tamada, Koji. Invertible timer. 3,935,702, Cl. 58-144.000.

Tanaka, Atsuyuki, to Minolta Camera Kabushiki Kaisha. Illumination device for copying machine. 3,936,672, Cl. 240-47.000.

Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, to Canon Kabushiki Kaisha. Electrophotographic copying machine. 3,936,184, Cl. 355-15.000.

Tanaka, Keiji: *See—*
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Tanaka, Michihiko: *See—*
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Tanaka, Toshio; Hirayama, Mamoru; and Minami, Noriaki, to Omron Tateisi Electronics Co., Ltd. Automatic article vending machine. 3,935,933, Cl. 194-4.00R.

Tanase, Toshio: *See—*
Kuwako, Tomohisa; Tanase, Toshio; and Sasase, Naoshi, 3,936,680.

Taniguchi, Koichi: *See—*
Kawamura, Takahide; Yoshino, Muneki; and Taniguchi, Koichi, 3,935,919.

Tanikoshi, Kinji, to Canon Kabushiki Kaisha. Synchronous drive control system for dc motor. 3,936,710, Cl. 318-318.000.

Tassin, Claude J.: *See—*
Gaudy, Claude Francois; Giraud, Adrien; Tassin, Claude J.; and Pech, Christian H., 3,935,910.

Tateishi, Kohshi: *See—*
Satomi, Takeo; Mukai, Kunio; Mine, Akihiko; Hino, Naganori; Tateishi, Kohshi; and Hirano, Masachika, 3,936,433.

Tatsukawa, Keizo: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Koiwa, Yoichi; Miike, Akira; Nomura, Tatsuo; and Kobayashi, Shohei, 3,936,469.

Tavares, Robert F.; Agran, Jack; and Easter, William M., to Givaudan Corporation. Improving the odor of perfume by novel cyclic ketal. 3,936,398, Cl. 252-522.000.

Taylor, Bobby W. Tool for removing shock absorbers and the like. 3,935,760, Cl. 81-55.000.

Taylor, John R., to International Business Machines Corporation. Rotatable data storage apparatus with track selection actuator having multiple velocities. 3,936,876, Cl. 360-78.000.

Taylor, Lucian W.; and Yarborough, John M., Jr., to Velcon Filters, Inc. Signal averaging circuit. 3,936,663, Cl. 235-150.510.

Teale, Alfred William: *See—*
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TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC: *See—*
Thuy, Hans-Joachim; and Dickopp, Gerhard, 3,936,867.

Teeters, Darrel L., Sr.; and Teeters, Garey D. Electric service panel for underground service installations having adjustable conduit attaching means. 3,936,589, Cl. 174-65.00R.

Teeters, Garey D.: *See—*
Teeters, Darrel L., Sr.; and Teeters, Garey D., 3,936,589.

Tegtmeier, Richard J.; Helms, Jimmy L.; and Backhaus, Karl L., to Concast Incorporated. Method for cooling a continuously cast strand. 3,935,896, Cl. 164-89.000.

Teijin Limited: *See—*
Nagahama, Shizuo; Shimada, Keizo; Nishikawa, Takeo; and Harada, Toshiaki, 3,936,509.
Takeshita, Toru; and Ishimoto, Sachio, 3,936,478.

Teleflex Incorporated: *See—*
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Telefonaktiebolaget L M Ericsson: *See—*
Hjortendal, Royne Gunnar; and Olsson, Jons Kurt Alvar, 3,936,612.
Lindeberg, Sven-Erik, 3,936,781.

Teletype Corporation: *See—*
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Terata, Hiroshi: *See—*
Sawai, Yukio; Sakurai, Yoshifumi; and Terata, Hiroshi, 3,935,711.

Terhune, F. Lee; and Rampy, Gordon A., to FMC Corporation. Triaryl phosphate ester plasticizers for polyvinyl chloride compositions. 3,936,410, Cl. 260-30.60R.

Teroson GmbH: *See—*
Rocholl, Martin-Gottfried, 3,936,412.

Terry, John C.; Barnett, Steven V.; and Lloyd, John, to Gillette Company, The. Safety razor. 3,935,639, Cl. 30-47.000.

Tetervak, Alexei Fedorovich: *See—*
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.

Tetra Pak Developpement SA: *See—*
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Tetronics Research and Development Co. Ltd.: *See—*
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Teumin, Maria Ilinichna: *See—*
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.

Texas Instruments Incorporated: *See—*
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Holmes, Jerry D.; Lowe, Benjamin L.; and Moore, Samuel D., 3,936,751.
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Matzen, Walter T.; and Kendall, Don L., 3,936,789.
Mellon, Donald Williams; and Kempf, Richard Alan, 3,936,774.
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Textron, Inc.: *See—*
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Th. Goldschmidt AG: *See—*
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Thiery, Jean; and Chevalier, Andre, to Institut Francais du Petrole. Coupling for flexible pipe provided with reinforcing armourings. 3,936,118, Cl. 339-16.00R.

Thomas & Betts Corporation: *See—*
Luongo, Albert Michael; Reynolds, Frank J.; and Ruetsch, Rudolph R., 3,935,730.

Thomas, H. Ronald, to Xerox Corporation. Method for reducing particle size. 3,936,517, Cl. 264-28.000.

Thompson, John Maurice: *See—*
Marshall, Victor Gregory; and Thompson, John Maurice, 3,936,714.

Thomson-CSF: *See—*
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Huignard, Jean Pierre; and Spitz, Erich, 3,936,139.

Thorpe, Laurence Joseph, to RCA Corporation. Television studio control apparatus. 3,936,868, Cl. 358-22.000.

Throckmorton, Morford C., to Goodyear Tire & Rubber Company, The. Process of polymerization of conjugated diolefins using iron catalysts and sulfur ligands. 3,936,432, Cl. 260-94.300.

Thuy, Hans-Joachim; and Dickopp, Gerhard, to TED Bildplatten Aktiengesellschaft, AEG-Telefunken, TELDEC. Record carrier, method of producing the record carrier and method for reproducing stored signal therefrom. 3,936,867, Cl. 358-4.000.

Tichy, Dieter: *See—*
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Tiefenthal, Harlan E.: *See—*
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Tiefenthal, Josef Maria Herbert, to Monotype Corporation, Limited, The. Photocomposing apparatus. 3,936,841, Cl. 354-10.000.

Tjukalov, Grigory Vasilievich: *See—*
Birjukova, Tatyana Anatolievna; Freze, Nikolai Ivanovich; Schukin, Alexei Alexeevich; Abalikhin, Anatoly Vasilievich; Maltsev, Mikhail Vasilievich; Evgrafov, Nikolai Nikolaevich; Semenov, Sergei Gavrilovich; Zhukova, Valentina Pavlovna; Teumin, Maria Ilinichna; Isaichenko, Veronika Vasilievna; Nerodenko, Mikhail Minovich; Alexeenko, Galina Nikolaevna; Tetervak, Alexei Fedorovich; Gurevich, Samuil Mordkovich; Tjukalov, Grigory Vasilievich; and Kurganov, Georgy Vladimirovich, 3,936,689.

Toagosei Chemical Industry Co., Ltd.: *See—*
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Toba, Hirotaka; Ohata, Keiichi; and Tsukane, Nagayoshi, to Daicel Ltd. Process for preparing polyisobutylene oxide moldings of excellent workability. 3,936,524, Cl. 264-288.000.

Todo, Naoyuki: *See—*
Ueda, Shigeru; Nakata, Yoshinori; Yokoyama, Shinichi; Todo, Naoyuki; Yoshida, Yuji; Ishii, Tadao; and Takeya, Gen, 3,936,371.

Tokai Denka Kogyo Kabushiki Kaisha: *See—*
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Tokico Ltd.: *See—*
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Tokui, Masaaki: *See—*
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Tokyo Juki Kogyo Kabushiki Kaisha: *See—*
Matsubara, Toru, 3,935,813.

Tomomatsu, Hideo, to Quaker Oats Company, The. Modified, fire retardant polyurethane. 3,936,425, Cl. 260-77.5AP.

Toner, Anthony S., to Sterling Drug Inc. X-ray dental film holder. 3,936,643, Cl. 250-478.000.

Tong, Duncan, to Playart Ltd. Submersible toy. 3,935,665, Cl. 46-91.000.

Toray Industries, Inc.: *See—*
Hayashi, Masahiko; Ikeuchi, Hiroyuki; and Tanaka, Michihiko, 3,936,421.
Nagao, Shozo; Mitani, Naoyuki; Ikuta, Michinobu; and Fujisawa, Kenji, 3,935,924.

Toshiba Seiki Kabushiki Kaisha: *See—*
Iida, Makoto; and Kuroda, Akira, 3,935,699.

Toth, John E., to Gilber B. Razran. Vision examination lens system. 3,936,163, Cl. 351-17.000.

Tournayre, Jean Claude: *See—*
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Towlsaver, Inc.: *See—*
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Toyo Boseki Kabushiki Kaisha: *See—*
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Toyo Cloth Co., Ltd.: *See—*
Sakaguchi, Fumio; Takemura, Kenji; Suzuki, Tadao; Yamazaki, Isamu; Nishibayashi, Yoshifumi; Shiozawa, Kazunobu; and Sasaki, Toshimitsu, 3,936,403.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Trabler, Martin: *See—*
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Traister, Robert L.; and Reehil, Edward G., to Xerox Corporation. Fuser apparatus for electrostatic reproducing machines. 3,936,658, Cl. 219-216.000.

Tramposch, Herbert, to Pitney-Bowes, Inc. Plastic and metal article of manufacture. 3,935,937, Cl. 197-53.000.

Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat: *See—*
Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Agejev, G. Sz.; and Alekszejev, I. A., 3,935,902.

Transland, Inc.: *See—*
Barlow, Conrad R., 3,936,018.

Travaglini, Michael J.; and Abbruzzesi, Joseph F., to Westinghouse Electric Corporation. Inspection port for turbines. 3,936,217, Cl. 415-118.000.

Trefileries Leon Bekaert, P.V.B.A.: *See—*
Moens, Joris, 3,936,278.

Trenkler, George: *See—*
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Trickey, Arthur J.: *See—*
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Trickey, Arthur M.: *See—*
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Trip Inspectors, Inc.: *See—*
Clary, Derwin R., 3,936,733.

Trojahn, Charles J.: *See—*
Trojahn, Charles Joseph; and Friedrich, Nikolaus, 3,935,688.

Trojahn, Charles Joseph; and Friedrich, Nikolaus, to Trojahn, Charles J.; Friedrich Metal Products Co.; and Frank Brunckhorst Co. Impervious wall structure. 3,935,688, Cl. 52-622.000.

Troncosco, Fernando, Jr. Archery bow and arrow support. 3,935,854, Cl. 124-24.00R.

Tropic Industries, Inc.: *See—*
McKinnon, Paul G., 3,936,039.

Truck-Lite Company, Inc.: *See—*
Morrison, Charles R., 3,936,127.

TRW Inc.: *See—*
Goff, Raymon L., 3,935,790.

Tsang, Frederick, to Intel Corporation. Bipolar memory cell employing inverted transistors and pinched base resistors. 3,936,813, Cl. 340-173.0FF.

Tschirky, John E.; and Crase, Gary Monroe, to Smith International, Inc. Floating flow restrictors for fluid motors. 3,936,247, Cl. 418-48.000.

Tsilibes, George N.: *See—*
Kidd, Wayne L.; Tsilibes, George N.; and Urciuoli, Stephen C., 3,936,173.

Tsuchimochi, Yoshihisa: *See—*
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 3,935,909.

Tsujimoto, Kayoshi, to Minolta Camera Kabushiki Kaisha. Device for detecting focussing in optical instruments. 3,936,849, Cl. 354-195.000.

Tsukane, Nagayoshi: *See—*
Toba, Hirotaka; Ohata, Keiichi; and Tsukane, Nagayoshi, 3,936,524.
Tsunemoto, Shiro; Hirayama, Eiichi; and Mizuguchi, Teruki, to Fuji Plastic Co., Ltd. Pressure actuated nozzle valve for injection molding units. 3,935,972, Cl. 222-146.0HE.
Tucci, John James, to AMP Incorporated. Apparatus for inserting wires into terminals in an electrical connector. 3,935,628, Cl. 29-203.0DT.
Tucker, James W.; and Bobinger, Robert O., to General Electric Company. Device for locking turbomachinery blades. 3,936,234, Cl. 416-220.00R.
Tudisco, Vincent J., to Creative Tools, Inc. Tool assembly for mounting bits. 3,935,762, Cl. 81-177.00G.
Turner, Jerry: *See—*
Zeffren, Eugene; and Turner, Jerry, 3,935,868.
Turpin, Gerald Leslie. Camera with a device for directing supplementary light into the imaging lens. 3,936,852, Cl. 354-295.000.
Tuttle, John D.; and Wagner, Delbert J. Waterproof connector. 3,936,124, Cl. 339-60.00M.
Tyco Laboratories, Inc.: *See—*
Mermelstein, Seymour, 3,935,636.
Tyeploelektroprojekt: *See—*
Heller, Laszlo; Forgo, Laszlo; Bodas, Janos; Agejev, G. Sz.; and Alekszejev, I. A., 3,935,902.
Tylko, Josef Kazimierz, to Tetronics Research and Development Co. Ltd. Arc furnaces and to methods of treating materials in such furnaces. 3,936,586, Cl. 13-9.00R.
Tyrone Hydraulics, Inc.: *See—*
Eley, James M.; and Joyce, Arthur B., 3,935,917.
U.M.C. Industries, Inc.: *See—*
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Uchida, Keiichi: *See—*
Oda, Yoshio; Uchida, Keiichi; Suhara, Manabu; and Morimoto, Takeshi, 3,936,505.
Uchida, Kuniki; Araki, Kenzi; and Fukunaka, Shiro, to Nippon Kokan Kabushiki Kaisha. Method of making high strength cold reduced steel by a full continuous annealing process. 3,936,324, Cl. 148-12.00F.
Uchiya Co., Ltd.: *See—*
Uchiya, Tomoyoshi, 3,936,788.
Uchiya, Tomoyoshi, to Uchiya Co., Ltd. Thermobimetal-carrying elastic member and temperature-control circuit component using the member as sensing element. 3,936,788, Cl. 337-372.000.
Ueda, Shigeru; Nakata, Yoshinori; Yokoyama, Shinichi; Todo, Naoyuki; Yoshida, Yuji; Ishii, Tadao; and Takeya, Gen, to Agency of Industrial Science & Technology. Method for removing vanadium, nickel, and sulfur from hydrocarbon oils. 3,936,371, Cl. 208-251.00H.
Ueda, Toshio: *See—*
Yamazaki, Eiichi; Ueda, Toshio; Maruyama, Koichi; and Ogura, Iwao, 3,936,151.
Uehara, Takashi: *See—*
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Ueki, Yoshiharu: *See—*
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Ulrich, Bodo: *See—*
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Ultra-Violet Products, Inc.: *See—*
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Ultronic Systems Corporation: *See—*
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O'Neill, Joseph L., Jr., 3,936,808.
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UNELEC: *See—*
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Unger, Klaus; and Berg, Karlheinz, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the production of silicon dioxide ion exchangers. 3,936,388, Cl. 252-182.000.
Unie Van Kunstmestfabrieken, B.V.: *See—*
Kaasenbrood, Petrus J. C.; and Verstegen, Johannes D. M., 3,936,500.
Union Carbide Corporation: *See—*
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Union Special Corporation: *See—*
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United Kingdom Atomic Energy Authority: *See—*
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United Merchants and Manufacturers, Inc.: *See—*
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Buhrmann, Gilbert W., Jr., 3,935,834.
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Energy Research & Development Administration: *See—*
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U.S. Philips Corporation: *See—*
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Desvignes, Francois, 3,936,629.
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United States Steel Corporation: *See—*
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Universal Oil Products Company: *See—*
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Hogan, Gerard T., 3,936,093.
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Upjohn Company, The: *See—*
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Urano, Fumio: *See—*
Kurei, Hiroshi; Urano, Fumio; and Nomura, Katsuhiko, 3,936,843.
Urciuoli, Stephen C.: *See—*
Kidd, Wayne L.; Tsilibes, George N.; and Urciuoli, Stephen C., 3,936,173.
Uriu, Kohei. Box that functions both as enclosed container and open receptacle. 3,935,992, Cl. 229-38.000.
USM Corporation: *See—*
Brotchie, Walter J., 3,935,609.
Pretty, Frederick A., 3,935,778.
Vallese, Lucio M.; Clark, Gordon L.; and Bailey, James C., to United States of America, Navy. High powered ferrite loaded helicopter antenna. 3,936,834, Cl. 343-708.000.
Vandale, Leonard A.: *See—*
Kline, Crandall R., Jr.; and Vandale, Leonard A., 3,935,676.
Vanderpool, Clarence D.; MacInnis, Martin B.; and Patton, James C., Jr., to GTE Sylvania Incorporated. Process for the manufacture of ammonium tungstate ammonium paratungstate, ammonium metatungstate and hydrated tungsten trioxide. 3,936,362, Cl. 204-86.000.

van der Sangen, Jean G.: *See—*
Schoen, Lowhardt A. A.; Visseren, Marinus J. R.; and van der Sangen, Jean G., 3,936,430.

Vanderscors, Robert L.: *See—*
Leverenz, Melvin E.; and Vanderscors, Robert L., 3,936,274.

van Esdonk, Johannes; and Hornman, Johannes Petrus, to U.S. Philips Corporation. Gas discharge panel having electrodes secured to flat insulating plates by means of glaze. 3,936,688, Cl. 313-220.000.

Van Haaften, Egbert, to Bulova Watch Company, Inc. Switching mechanism for electronic watch electro-optic display. 3,935,700, Cl. 58-4.00A.

Van Hoof, Albert Emiel; and Holvoet, Georges Arthur, to AGFA-GEVAERT N.V. Adhesive tape. 3,936,571, Cl. 428-355.000.

van Leeuwen, Johannes Aloysius: *See—*
Bakker, Gijsbertus; and van Leeuwen, Johannes Aloysius, 3,936,691.

Van Noppen, Jean M.: *See—*
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Van Ornum, Joel V.: *See—*
Stang, Peter L.; and Van Ornum, Joel V., 3,935,893.

van Vliet, Cors, to N.V. Werktuigenfabricke Mulder. Air heater, especially for connection to a central heating system. 3,935,855, Cl. 126-110.00R.

Van Zante, William R.; and Ver Ploeg, Alonzo. Cutter disc. 3,935,887, Cl. 144-235.000.

Varian Associates: *See—*
Chupp, Vernon L., 3,936,191.
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Vaughn, George A.; and Hargrave, Richard D., to Maark Corporation. Platform tennis court. 3,935,687, Cl. 52-483.000.

Veil, Martin: *See—*
Finsterwalder, Kurt; Philipp, Karl-Heinz; Veil, Martin; Widmann, Karl; and Zwerina, Karl, 3,935,724.

Velcon Filters, Inc.: *See—*
Taylor, Lucian W.; and Yarborough, John M., Jr., 3,936,663.

Vereinigte Baubeschlagfabriken Gretsch and Co. GmbH: *See—*
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Verstegen, Johannes D. M.: *See—*
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Vesely, Edward U., to W. H. Brady Co. Light-reflective adhesive label. 3,936,567, Cl. 428-325.000.

Vetco Offshore Industries, Inc.: *See—*
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Vickers, James L.: *See—*
Meyer, Melvin H.; Vickers, James L.; Waycie, Edmund A.; and Weitzel, Gerald, 3,935,943.

Victor Company of Japan, Limited: *See—*
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Victor Comptometer Corporation: *See—*
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Vidon, Bruno: *See—*
Perret, Jean-Pierre; and Vidon, Bruno, 3,936,275.

Viout, Andre; Esanu, David, deceased; and Samama, Lydie Esther, administratrix, to Societe Anonyme dite: L'Oreal. Magnesium salt copolymers of unsaturated dicarboxylic acid anhydride and unsaturated monomer having a lipophile chain. 3,936,427, Cl. 260-78.50T.

Virgil, Eldon E. Diesel fuel line heater. 3,935,901, Cl. 165-52.000.

Visseren, Marinus J. R.: *See—*
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Vistron Corporation: *See—*
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Vitt, Louis O. Amusement device. 3,935,667, Cl. 46-202.000.

VLN Corporation: *See—*
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Vockenhuber, Karl: *See—*
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Vogelaar, Willard G.: *See—*
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Vogt, Norman H. Cleaning apparatus for overhead rails. 3,935,610, Cl. 15-21.00R.

Voiturier, Jean-Pierre; and Jacquemin, Francis, to Glaverbel S.A. Fire screen for a structural panel. 3,935,681, Cl. 52-1.000.

Von Bieren, Karlheinz. Interferometer for the measurement of wavefront sections of general imaging systems including the human eye. 3,936,160, Cl. 351-6.000.

Von Langendorff, Vitmar G.: *See—*
Demus, Duane J.; and Von Langendorff, Vitmar G., 3,935,772.

von Langenthal, Wolfram: *See—*
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von Matuschka, Alfred Graf: *See—*
Fichtl, Walter; Wiebke, Gunter; Kunst, Helmut; von Matuschka, Alfred Graf; Bachmann, Georg; and Lipp, Alfred, 3,936,327.

von Recklinghausen, Daniel R., to Eastern Air Devices, Inc. Half-wave rectifier circuit. 3,936,720, Cl. 321-8.00R.

von Rintelen, Harald: *See—*
Rosenkranz, Hans-Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, 3,936,428.

Von Wlassaty, Joachim: *See—*
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W. H. Brady Co.: *See—*
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Wachter, William J.; and Rohrer, Wesley M., to Rohrer, Wesley M.; and Wachter, William J., part interest to each. Method and apparatus for detection of nuclear fuel rod failures. 3,936,348, Cl. 176-19.0LD.

Wacker-Chemie GmbH: *See—*
Kirst, Paul-Gerhard; Maier, Karl; and Winkler, Heinz, 3,936,311.

Wada, Nobuhito, to Mahmut Starkow. Roller skate. 3,936,061, Cl. 280-11.230.

Wade, Robert M.: *See—*
Smith, Lambert C.; Meridith, Verne A.; and Wade, Robert M., 3,936,591.

Wade, Virdell H. Rifle rest. 3,935,657, Cl. 42-94.000.

Wagemer, Wilfried, to AEG-Elotherm G.m.b.H. Medium frequency power transformer with a secondary winding suitable for a rigid connection with an inductor through which the coolant flows. 3,936,783, Cl. 336-62.000.

Wagner, Delbert J.: *See—*
Tuttle, John D.; and Wagner, Delbert J., 3,936,124.

Wagner Electric Corporation: *See—*
Carton, Michael L., 3,935,620.

Wagner, Herbert A.; and Katkov, Robert B., to Howe Richardson Scale Company. Platform weighing scale. 3,935,913, Cl. 177-134.000.

Wakahara, Shigeo, to Nippon Kogaku K.K. Device for automatically controlling a protective filter in a film projector. 3,936,167, Cl. 352-148.000.

Wakeman, Alfred W. Joint forming tape for a collapsible cylindrical container. 3,935,615, Cl. 16-150.000.

Waldeck, Gary C., to GTE Automatic Electric Laboratories Incorporated. Submultiplex transmission of alarm status signals for a time division multiplex system. 3,936,609, Cl. 179-15.0BF.

Walker, Alan John. Magnetic coupling. 3,936,683, Cl. 310-103.000.

Walker, Wilmer David, Jr. Tethered-ball game having suspended receiving means. 3,936,051, Cl. 273-95.00A.

Wall, Albert. Guide means for cutting hair. 3,935,870, Cl. 132-45.00R.

Wallace, Charles Frank, Jr.: *See—*
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Walls, Robert R., to Western Magnum Corporation. Tape removal machine. 3,936,343, Cl. 156-368.000.

Wallyn, Rene. Damping device for coupling together piping elements. 3,936,078, Cl. 285-49.000.

Walter, Gerhard W. H.; and Pietsch, Gunter W. E., to Howaldtswerke - Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Shaft seals. 3,936,057, Cl. 277-59.000.

Walton, Richard Eugene, II: *See—*
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Wambach, Allen D., to General Electric Company. Flame retardant foamed polyester compositions. 3,936,400, Cl. 260-2.50N.

Wang, Richard H. S.; and Irick, Gether, Jr., to Eastman Kodak Company. Multichromophoric ultraviolet stabilizers and their use in organic compositions. 3,936,419, Cl. 260-45.80N.

Wang, Richard Hsu-Shien: *See—*
Pond, David Martin; and Wang, Richard Hsu-Shien, 3,936,418.

Wanke, Ronald L. Acoustic abatement method and apparatus. 3,936,606, Cl. 179-1.00P.

Ward, Truman L.; and Benerito, Ruth R., to United States of America, Agriculture. Electrically conductive glasslike films on glass or ceramic surfaces from aluminum and plumbite-treated cellulosics. 3,936,580, Cl. 428-446.000.

Wareham, Richard R., to Polaroid Corporation. Ever-ready camera case. 3,936,851, Cl. 354-288.000.

Warn Industries, Inc.: *See—*
Williams, Richard D., 3,935,753.

Warncke, Ernst, to Dragerwerk Aktiengesellschaft. Protective breathing mask with compressed air supply for breathing. 3,935,861, Cl. 128-142.00R.

Warner-Lambert Company: *See—*
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Kaminsky, Daniel, 3,936,488.
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Warwick Electronics Inc.: *See—*
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Waschulzik, Walter; and Dyczek, Maximilian, to Gewerkschaft Eisenhutte Westfalia. Apparatus with a working platform and adjustable legs therefor. 3,936,032, Cl. 254-108.000.
Wasley, William L.; and Pittman, Allen G., to United States of America, Agriculture. Flameproofing wool textiles. 3,936,267, Cl. 8-128.00R.
Watanabe, Akio: *See—*
Miyazawa, Yoshihide; Ozutsumi, Minoru; Ogawa, Satoshi; Saeki, Keiso; and Watanabe, Akio, 3,936,564.
Watanabe, Tadashi; and Maruyama, Tsutomu, to Kansai Paint Company, Ltd. Method for curing a coating film. 3,936,368, Cl. 204-181.000.
Watanabe, Tsutomu; Nakayama, Takahiro; and Yamaoka, Sigenori, to Sumitomo Bakelite Company, Limited. Flexible metal-clad laminates and method for manufacturing the same. 3,936,575, Cl. 428-417.000.
Waters, Elmer Dale, to McDonnell Douglas Corporation. Permafrost structural support with integral heat pipe means. 3,935,900, Cl. 165-45.000.
Watt, William Russell, to American Can Company. Epoxide blend for polymerizable coating compositions and process. 3,936,557, Cl. 428-211.000.
Waycie, Edmund A.: *See—*
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Weaver, Lelland A. C.: *See—*
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Weber, Bernd, to Akzona Incorporated. Stuffer crimping apparatus. 3,935,621, Cl. 28-1.600.
Weber, Charles A., to Rockwell International Corporation. Fast search and lock-on means for distance measuring equipment. 3,936,823, Cl. 343-7.300.
Weedon, Gene Clyde: *See—*
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 3,936,253.
Wehr Corporation: *See—*
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Weidenhammer, James A.: *See—*
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B 256,334	3,924,988	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,452	3,925,083	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,603	3,915,571	Oct. 28, 1975
B 288,018	3,925,239	Dec. 9, 1975	B 321,018	3,921,623	Nov. 25, 1975
B 288,627	3,916,179	Oct. 28, 1975	B 321,101	3,917,163	Nov. 4, 1975
B 288,638	3,925,132	Dec. 9, 1975	B 321,938	3,923,889	Dec. 2, 1975
B 289,175	3,924,309	Dec. 9, 1975	B 322,182	3,925,390	Dec. 9, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 322,239	3,920,973	Nov. 18, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 358,174	3,924,958	Dec. 9, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,136	3,919,453	Nov. 11, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,910	3,925,696	Dec. 9, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 346,350	3,915,824	Oct. 28, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 346,487	3,927,406	Dec. 16, 1975	B 363,205	3,923,744	Dec. 2, 1975
B 346,585	3,913,820	Oct. 21, 1975	B 363,337	3,928,639	Dec. 23, 1975
B 346,613	3,923,545	Dec. 2, 1975	B 363,457	3,922,595	Nov. 25, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 363,674	3,929,716	Dec. 30, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 388,580	3,922,712	Dec. 2, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,657	3,927,362	Dec. 16, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 409,816	3,921,317	Nov. 25, 1975
B 386,592	3,925,305	Dec. 9, 1975	B 410,062	3,923,855	Dec. 2, 1975
B 387,039	3,924,510	Dec. 9, 1975	B 410,168	3,914,717	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975	B 411,145	3,914,168	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975	B 411,356	3,919,649	Nov. 11, 1975
B 387,687	3,918,151	Nov. 11, 1975	B 411,483	3,925,196	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 411,633	3,914,741	Oct. 21, 1975	B 425,541	3,914,051	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975	B 425,572	3,923,822	Dec. 2, 1975
B 412,619	3,925,292	Dec. 9, 1975	B 427,631	3,921,433	Nov. 25, 1975
B 412,867	3,924,587	Dec. 9, 1975	B 428,177	3,914,624	Oct. 21, 1975
B 413,006	3,914,850	Oct. 28, 1975	B 428,795	3,921,056	Nov. 18, 1975
B 413,546	3,924,314	Dec. 9, 1975	B 429,442	3,923,485	Dec. 2, 1975
B 414,129	3,925,484	Dec. 9, 1975	B 430,106	3,918,941	Nov. 11, 1975
B 414,288	3,925,537	Dec. 9, 1975	B 430,140	3,922,084	Nov. 25, 1975
B 415,113	3,915,717	Oct. 28, 1975	B 430,798	3,918,204	Nov. 11, 1975
B 415,124	3,915,944	Oct. 28, 1975	B 430,944	3,922,096	Nov. 25, 1975
B 415,845	3,925,076	Dec. 9, 1975	B 432,373	3,919,670	Nov. 11, 1975
B 415,847	3,914,208	Oct. 21, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975	B 435,343	3,919,244	Nov. 11, 1975
B 415,977	3,927,359	Dec. 16, 1975	B 435,844	3,925,170	Dec. 9, 1975
B 416,598	3,923,473	Dec. 2, 1975	B 437,173	3,924,627	Dec. 9, 1975
B 416,832	3,924,975	Dec. 9, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 416,710	3,923,746	Dec. 2, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 416,933	3,924,968	Dec. 9, 1975	B 437,450	3,922,479	Nov. 25, 1975
B 417,299	3,918,235	Nov. 11, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 418,121	3,925,023	Dec. 9, 1975	B 438,706	3,925,050	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 418,302	3,913,252	Oct. 21, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 419,327	3,921,197	Nov. 18, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 419,481	3,924,970	Dec. 9, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 420,016	3,914,572	Oct. 21, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 420,514	3,923,929	Dec. 2, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 420,568	3,925,069	Dec. 9, 1975	B 442,919	3,925,483	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975	B 444,614	3,927,996	Dec. 23, 1975
B 421,362	3,924,817	Dec. 9, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 421,383	3,925,047	Dec. 9, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 448,571	3,924,760	Dec. 9, 1975
B 422,399	3,928,656	Dec. 23, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 422,467	3,924,804	Dec. 9, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 422,949	3,921,873	Nov. 25, 1975	B 450,546	3,924,417	Dec. 9, 1975
B 424,415	3,919,458	Nov. 11, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 424,462	3,920,522	Nov. 18, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 424,572	3,924,979	Dec. 9, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 424,748	3,924,395	Dec. 9, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 425,035	3,914,025	Oct. 21, 1975	B 459,425	3,928,773	Dec. 23, 1975
B 425,345	3,922,015	Nov. 25, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 425,470	3,923,796	Dec. 2, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 425,539	3,916,742	Nov. 4, 1975	B 468,198	3,925,340	Dec. 9, 1975

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 3RD DAY OF FEBRUARY, 1976

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687.

Brackeen, Billie E.: *See*—
Schorn, Victor J., and Brackeen. T943,003.
Canter, Frank C.: *See*—
Hagemeyer, Hugh J., Jr., Canter, and De Jean. T943,002.
Davis, Lee H.: *See*—
Leonard, Don R., and Davis. T943,007.
Glaccone, Leonard F., and L. J. Woodrum, to International Business Machines Corp. Dynamic priority queueing mechanism method and means. T943,006, 2–3–76, Cl. 444—1.
Hagemeyer, Hugh J., Jr., F. C. Canter, and R. A. De Jean. Process for the oxidation of olefinically unsaturated compounds to carbonyl compounds. T943,002, 2–3–76, Cl. 260—604.
Hara, Hisao, to Hitachi Metals, Ltd. Method for manufacturing tool alloys by powder metallurgy. T943,008, 2–3–76, Cl. 148—11.5.
Hitachi Metals, Ltd.: *See*—
Hara, Hisao. T943,008.
ICC United States: *See*—
Pettoruto, Nicholas R. T943,010.
International Business Machines Corp.: *See*—
Mennone, Angelo. T942,001.
Glaccone, Leonard F., and Woodrum. T943,006.
Schneider, Richard C. T943,004.
Leonard, Don R., and L. H. Davis. Rigid unsaturated polyester cellular material. T943,007, 2–3–76, Cl. 260—2.5.
Mennone, Angelo, to International Business Machines Corp. Dynamic redundancy method for an automated logic mapping system. T943,001, 2–3–76, Cl. 444—1.
Monsanto Co.: *See*—
Smith, Andrew I. T943,009.
Pettoruto, Nicholas R., to ICC United States. Foamable chlorexidine-containing system. T943,010, 2–3–76, Cl. 424—316.
Schneider, Richard C., to International Business Machines Corp. Read signal equalization or compensation network. T943,004, 2–3–76, Cl. 360—65.
Schorn, Victor J., and B. E. Bracken. Atmospheric ambient air temperature monitoring system and probe therefore. T943,003, 2–3–76, Cl. 73—362.
Smith, Andrew I., to Monsanto Co. Stabilized spandex polymers. T943,009, 2–3–76. Cl. 260—45.8.
Smithkey, John D., Jr. Method of building a radial tire. T943,005, 2–3–76, Cl. 156—123.
Woodrum, Luther J.: *See*—
Glaccone, Leonard F., and Woodrum. T943,006.

LIST OF REISSUE PATENTEES

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Beale, Julian Robert Anthony: *See*—
Robinson, David Phythian; Beale, Julian Robert Anthony; Shannon, John Martin; Kerr, John Anthony; and Das, Mukunda Behari, Re. 28,704.
Das, Mukunda Behari: *See*—
Robinson, David Phythian; Beale, Julian Robert Anthony; Shannon, John Martin; Kerr, John Anthony; and Das, Mukunda Behari, Re. 28,704.
Dorey, Howard Anthony, to Solartron Electronic Group Limited, The. Triple-slope analog-to-digital converters. Re. 28,706, Cl. 340-347.0NT.
General Electric Company: *See*—
Hoffmeyer, William R., Re. 28,705.
Hoffmeyer, William R., to General Electric Company. Stator slot and winding arrangements. Re. 28,705, Cl. 310-180.000.
Kerr, John Anthony: *See*—
Robinson, David Phythian; Beale, Julian Robert Anthony; Shannon, John Martin; Kerr, John Anthony; and Das, Mukunda Behari, Re. 28,704.
Koelmans, Hein: *See*—
Te Velde, Ties Siebolt; and Koelmans, Hein, Re. 28,703.
Robinson, David Phythian; Beale, Julian Robert Anthony; Shannon, John Martin; Kerr, John Anthony; and Das, Mukunda Behari, to U.S. Philips Corporation. Semiconductor devices. Re. 28,704, Cl. 148-1.500.
Shannon, John Martin: *See*—
Robinson, David Phythian; Beale, Julian Robert Anthony; Shannon, John Martin; Kerr, John Anthony; and Das, Mukunda Behari, Re. 28,704.
Solartron Electronic Group Limited, The: *See*—
Dorey, Howard Anthony, Re. 28,706.
Te Velde, Ties Siebolt; and Koelmans, Hein, to U.S. Philips Corporation. Method of manufacturing a semiconductor device. Re. 28,703, Cl. 29-571.000.
U.S. Philips Corporation: *See*—
Robinson, David Phythian; Beale, Julian Robert Anthony; Shannon, John Martin; Kerr, John Anthony; and Das, Mukunda Behari, Re. 28,704.
Te Velde, Ties Siebolt; and Koelmans, Hein, Re. 28,703.

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Jacklin, Arden W. 3,828.
Jacklin, Arden W., to The Baughan-Jacklin Corp. Canada bluegrass plant. 3,828, 2–3–76, Cl. 88.
Jackson & Perkins Co.: *See*—
Warriner, William A. 3,829.
Warriner, William A., to Jackson & Perkins Co. Rose plant. 3,829, 2–3–76, Cl. 25.

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American Can Co.: *See*—
Wallace, Sydney J. 238,659.
American Hospital Supply Corp.: *See*—
Cacanindin, Vincent A. 238,710.
American Standard Inc.: *See*—
Stairs, Henry M., Jr. 238,673.
Ammons, Robert G., Sr. Zipper puller. 238,630, 2–3–76, Cl. D2—415.
Bauer, Frederick K. Traveling case for garments. 238,718, 2–3–76, Cl. D87—1.
Beamer, John D., to Rain Bird Sprinkler Mfg. Corp. Rotary lawn sprinkler. 238,670, 2–3–76, Cl. D23—7.
Becker, William M. Rack. 238,645, 2–3–76, Cl. D6—184.
Berkey Photo, Inc.: *See*—
Emmerling, Ronald. 238,705.
Bero, Robert D., to Plaskolite, Inc. Foldable panel-holding strip. 238,667, 2–3–76, Cl. D13—6.
Binzen, Elliot J. Table. 238,643, 2–3–76, Cl. D6—177.

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Branstrom, Donald F. Propulsion apparatus for water cycle. 238,664, 2–3–76, Cl. D12—68.
Braunhut, Harold N. Aquatic game speedway. 238,695, 2–3–76, Cl. D34—5.
Braunhut, Harold N. Aquatic game speedway. 238,696, 2–3–76, Cl. D34—5.
Britt, William J.: *See*—
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Buffington, Herman L. Liquid dispenser tower. 238,721, 2–3–76, Cl. D94—3.
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Jacobson, James W., Clayton, and Sims. 238,707.
CITC Industries Inc.: *See*—
Senter, Jonas. 238,626.
Cacanindin, Vincent A., to American Hospital Supply Corp. Bottle for medical liquid. 238,710, 2–3–76, Cl. D83—1.
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McNair, Samuel L. 238,715.
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Dugger, Richard P., to Ristance Wire, Inc. Ignition wire boot. 238,677, 2–3–76, Cl. D26—1.
Dugger, Richard P., to Ristance Wire, Inc. Ignition wire boot. 238,679, 2–3–76, Cl. D26—1.
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Erickson, Gerald. Bottle carrier. 238,657, 2–3–76, Cl. D9—178.
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Fortune, William S. Air blowing-vacuum desoldering appliance or the like. 238,651, 2–3–76, Cl. D8—30.
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Schifman, Edward J., to Aladdin Industries, Inc. Cart. 238,663, 2–3–76, Cl. D12—30.
Schimanski, Georg, to Globol-Werk GMBH. Air freshener or similar article. 238,675, 2–3–76, Cl. D23—150.
Schoblom, Svante. Furniture base. 238,646, 2–3–76, Cl. D6—196.
S. C. Johnson & Son, Inc.: *See*—
Luedtke, Warren J., and Devenport. 238,674.
Senter, Jonas, to CITC Industries Inc. Sport shoe. 238,626, 2–3–76, Cl. D2—310.
Shalom, Samuel. Aquarium. 238,688, 2–3–76, Cl. D30—8.
Shalom, Samuel. Combined aquarium and mirror. 238,689, 2–3–76, Cl. D30—11.
Sjodahl, Carl-Johan, to Dentalvarutjanst AB. Interdental wedge or similar article. 238,676, 2–3–76, Cl. D24—1.
Snyder, Jeffrey. Wall mountable rack. 238,640, 2–3–76, Cl. D6—114.
Solazzi, Monte J. Cell for X-ray spectroscopy or similar article. 238,693, 2–3–76, Cl. D32—1.
Stairs, Henry M., Jr., to American Standard Inc. Toilet seat cover. 238,673, 2–3–76, Cl. D23—71.
Stone, Stanford C., to Minnesota Mining and Mfg. Co. Developer powder container. 238,658, 2–3–76, Cl. D9—210.
Strickland Systems, Inc.: *See*—
Kelley, Dole J., Jr. 238,653.
Sweeney, Paul B.: *See*—
Pulos, Arthur J., and Sweeney. 238,680.
Sybron Corp.: *See*—
Peart, Edward L., and Ashe. 238,717.
Tibbetts, Paul E. Double handcuff case. 238,629, 2–3–76, Cl. D2—400.
Tomoda, Hiroshi, to Dunlop Ltd. Tire for a vehicle wheel. 238,665, 2–3–76, Cl. D12—146.
Vendo Co., The: *See*—
Black, Stewart L. 238,722.
Waker, Jerome A.: *See*—
Rosenberger, Edwin C., and Waker. 238,671.
Wallace, Sydney J., to American Can Co. Container end. 238,659, 2–3–76, Cl. D9—253.
Walters, Charles S. Flight data computer. 238,685, 2–3–76, Cl. D26—5.
Walz, David K., to Lanier Electronic Laboratory, Inc. Conference microphone or similar article. 238,684, 2–3–76, Cl. D26—14.
Weinstein, Berel: *See*—
Sagi, Zsigmond, Weinstein, and Pardo. 238,661.
Welch Allyn, Inc.: *See*—
Pulos, Arthur J., and Sweeney. 238,680.
Westguard Products, Inc.: *See*—
Kratky, Frank. 238,691.
Wilding, Gary, to Richton International Corp. Display stand. 238,632, 2–3–76, Cl. D6—23.
Winrow, Thomas, to Futorian Corp. Seat. 238,634, 2–3–76, Cl. D6—63.
York, Harold D., Jr. Thong sandal. 238,625, 2–3–76, Cl. D2—270.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

114	3,935,596
207	3,935,597

CLASS 4

57P	3,935,598
172	3,935,599
172.13	3,935,600
251	3,935,601
292	3,935,602

CLASS 5

11	3,935,603
90	3,935,604
351	3,935,605

CLASS 8

26	3,936,266
128R	3,936,267
173	3,936,268

CLASS 9

1T	3,935,606
2A	3,935,607
319	3,935,608

CLASS 12

128D	3,935,609

CLASS 13

9R	3,936,586
23	3,936,587
33	3,936,588

CLASS 15

21R	3,935,610
160	3,935,611
250.42	3,935,612

CLASS 16

30	3,935,613
48.5	3,935,614
150	3,935,615

CLASS 21

58	3,936,269
91	3,936,270

CLASS 23

230B	3,936,271
	3,936,272
253C	3,936,273
270R	3,936,274
278	3,936,275
301R	3,936,276

CLASS 24

20EE	3,935,616
81B	3,935,617
141	3,935,619
230AL	3,935,618
279	3,935,620

CLASS 28

1.6	3,935,621
21	3,935,622
63	3,935,623

CLASS 29

95R	3,935,624
156.8R	3,935,625
157.1R	3,935,626
159R	3,935,627
191.6	3,936,277
193	3,936,278
203DT	3,935,628
208C	3,935,629
227	3,935,630
432.1	3,935,631
455R	3,935,632
559	3,935,633
571	Re.28,703
577	3,935,634
578	3,935,635
619	3,935,636
628	3,935,637

CLASS 30

37	3,935,638
47	3,935,639

CLASS 32

40R	3,935,640

CLASS 33

177	3,935,641
302	3,935,642
312	3,935,643
324	3,935,644
363R	3,935,645

CLASS 34

92	3,935,646
105	3,935,647
131	3,935,648

CLASS 35

31D	3,935,649
48B	3,935,650
71	3,935,651

CLASS 40

78	3,935,652
125H	3,935,653
129C	3,935,654
145R	3,935,655
155	3,935,656

CLASS 42

94	3,935,657

CLASS 43

17.5	3,935,658
17.6	3,935,659
42.31	3,935,660
60	3,935,661
112	3,935,662

CLASS 44

63	3,936,279

CLASS 46

60	3,935,663
76R	3,935,664
91	3,935,665
131	3,935,666
202	3,935,667
220	3,935,668
228	3,935,669

CLASS 47

1.3	3,935,670
34A	3,935,672
34R	3,935,671
58	3,935,673

CLASS 49

212	3,935,674

CLASS 51

105SP	3,935,675
106R	3,935,676
134.5R	3,935,677
170T	3,935,678
239	3,935,679
313	3,935,680

CLASS 52

1	3,935,681
105	3,935,682
172	3,935,683
173DS	3,935,684
223L	3,935,685
302	3,935,686
483	3,935,687
622	3,935,688
722	3,935,689

CLASS 53

24	3,935,690
59R	3,935,691
126	3,935,692
184R	3,935,693
389	3,935,694

CLASS 55

3	3,936,280
71	3,936,281
217	3,936,282
230	3,936,283
274	3,936,284

CLASS 56

13.4	3,935,695
385	3,935,696
400	3,935,697

CLASS 57

18	3,935,698
52	3,935,699

CLASS 58

4A	3,935,700
50R	3,935,701
144	3,935,702

CLASS 60

39.28R	3,935,703
226R	3,935,704
302	3,935,705
444	3,935,706
517	3,935,707
517	3,935,708
547	3,935,709
657	3,935,710

CLASS 61

25	3,935,711
72.6	3,935,712

CLASS 62

77	3,935,713
187	3,935,714
475	3,935,715

CLASS 64

13	3,935,716
21	3,935,717

CLASS 65

3C	3,936,285
14	3,936,286
30E	3,936,287
33	3,936,288
65A	3,936,289
134	3,936,290
351	3,936,291

CLASS 66

9R	3,935,718

CLASS 68

58	3,935,719

CLASS 70

276	3,935,720

CLASS 71

63	3,936,292
118	3,936,293

CLASS 72

22	3,935,721
250	3,935,722
275	3,935,723
345	3,935,724
451	3,935,725

CLASS 73

37	3,935,727
41	3,935,728
60	3,935,726
	3,935,729
100	3,935,730
104	3,935,731
118	3,935,732
136A	3,935,733
194A	3,935,735
201	3,935,736
228	3,935,737
295	3,935,738
304C	3,935,739
	3,935,740
313	3,935,741
336.5	3,935,742
343R	3,935,743
361	3,935,744
398R	3,935,745
425.6	3,935,734
462	3,935,746
483	3,935,747
484	3,935,748

CLASS 74

6	3,935,749
61	3,935,750
230.18	3,935,751
473R	3,935,752
650	3,935,753
665F	3,935,754
815	3,935,755

CLASS 75

.5R	3,936,295
2	3,936,294
26	3,936,296
130.5	3,936,297
134R	3,936,298
224	3,936,299

CLASS 76

24R	3,935,756
74	3,935,757

CLASS 81

3R	3,935,758
9.51	3,935,759
55	3,935,760
	3,935,761
177G	3,935,762

CLASS 82

1C	3,935,763
1.2	3,935,764
19	3,935,765
21A	3,935,766

CLASS 83

5	3,935,767
39	3,935,768
79	3,935,769
95	3,935,770
140	3,935,771
	3,935,772
331	3,935,773
355	3,935,774
	3,935,775
425.4	3,935,776
471.3	3,935,777
639	3,935,778
762	3,935,779
820	3,935,780

CLASS 84

1.11	3,935,781
1.16	3,935,782
1.21	3,935,783
435	3,935,784

CLASS 85

46	3,935,785
68	3,935,786
80	3,935,787

CLASS 90

12R	3,935,788

CLASS 91

317	3,935,789
375A	3,935,790
411R	3,935,791
438	3,935,792
446	3,935,793
488	3,935,794

CLASS 92

5R	3,935,795
12.2	3,935,796
223	3,935,797

CLASS 93

39R	3,935,798
61R	3,935,799
	3,935,800
80	3,935,801
84R	3,935,802

CLASS 96

29D	3,936,300
36	3,936,301
36.1	3,936,302
74	3,936,303
82	3,936,304
84UV	3,936,305
87R	3,936,306
90R	3,936,307
136	3,936,308

CLASS 98

36	3,935,803

CLASS 99

293	3,935,804
300	3,935,805
340	3,935,806
352	3,935,807
353	3,935,808
447	3,935,809
467	3,935,810

CLASS 100

53	3,935,811
214	3,935,812

CLASS 101

93.31	3,935,813
232	3,935,814
349	3,935,815

CLASS 102

41	3,935,816
52	3,935,817
70.2P	3,935,818

CLASS 104

23FS	3,935,819
88	3,935,820
89	3,935,821
93	3,935,822

CLASS 106

21	3,936,309
90	3,936,310
	3,936,311
171	3,936,312
197R	3,936,313
243	3,936,314
309	3,936,315

CLASS 108

80	3,935,823

CLASS 110

8C	3,935,824
165R	3,935,825

CLASS 112

212	3,935,826
252	3,935,827

CLASS 114

102	3,935,828
206R	3,935,829
210	3,935,830
235A	3,935,831

CLASS 115

.5A	3,935,832
12R	3,935,833

CLASS 116

114V	3,935,834
118R	3,935,835

CLASS 118

60	3,935,836

CLASS 119

51.12	3,935,837
54	3,935,838
156	3,935,839

CLASS 123

8.23	3,935,840
8.47	3,935,841
52MF	3,935,842
117A	3,935,843
117R	3,935,844
	3,935,845
	3,935,846
119CF	3,935,847
	3,935,848
122AA	3,935,849
136	3,935,850
139E	3,935,851
148A	3,935,852
179G	3,935,853

CLASS 124

24R	3,935,854

CLASS 126

110R	3,935,855
208	3,935,856

CLASS 128

2.05C	3,935,984
2.5R	3,935,857
80C	3,935,858
89R	3,935,859
130	3,935,860
142R	3,935,861
287	3,935,862
296	3,935,863
418	3,935,864
488	3,935,865

CLASS 130

24	3,935,866
30R	3,935,867

CLASS 132

7	3,935,868
9	3,935,869
45R	3,935,870
54	3,935,871
88.7	3,935,872

CLASS 133

5R	3,935,873

CLASS 134

3	3,936,316
29	3,936,317

CLASS 135

16	3,935,874

CLASS 136

6R	3,936,318
89	3,936,319
242	3,936,320

CLASS 137

84	3,935,875
177	3,935,876
296	3,935,877
334	3,935,878
355.16	3,935,879
499	3,935,880
578	3,935,881

CLASS 138

30	3,935,882

CLASS 141

27	3,935,883
80	3,935,884
279	3,935,885
392	3,935,886

CLASS 144

235	3,935,887
327	3,935,888

CLASS 145

24	3,935,889

CLASS 148

1.5	Re.28,704
	3,936,321
	3,936,322
12EA	3,936,323
12F	3,936,324
26	3,936,325
	3,936,326
27	3,936,327
171	3,936,328
187	3,936,329

CLASS 149

35	3,936,330

CLASS 150

52R	3,935,890

CLASS 152

225R	3,935,891
330RF	3,935,892
347	3,935,893
356	3,935,894

CLASS 156

17	3,936,331
18	3,936,332
60	3,936,333
69	3,936,334
79	3,936,335
86	3,936,336
157	3,936,338
167	3,936,337
205	3,936,339
210	3,936,340
242	3,936,341
330	3,936,342
368	3,936,343
385	3,936,344
502	3,936,345
620	3,936,346

CLASS 162

146	3,936,347

CLASS 164

56	3,935,895
89	3,935,896

CLASS 165

1	3,935,897
22	3,935,898
29	3,935,899
45	3,935,900
52	3,935,901
110	3,935,902

CLASS 166

184	3,935,903

CLASS 172

20	3,935,904
40	3,935,905
177	3,935,906
314	3,935,907

CLASS 173

127	3,935,908
163	3,935,909

CLASS 174

65R	3,936,589
92	3,936,590
116	3,936,591
153R	3,936,592

CLASS 175
17 3,935,910
3,935,911
264 3,935,912

CLASS 176
19LD 3,936,348
78 3,936,349
87 3,936,350

CLASS 177
134 3,935,913
3,935,914
136 3,935,915

CLASS 178
5.1 3,936,593
3,936,594
5.6 3,936,595
6 3,936,596
6.8 3,936,597
3,936,598
7.3DC 3,936,599
17.5 3,936,600
22 3,936,601
58R 3,936,602
69.5R 3,936,603
3,936,604

CLASS 179
1SP 3,936,605
1N 3,936,607
1P 3,936,606
7.1R 3,936,608
15BF 3,936,609
15.55T 3,936,610
3,936,611
16EC 3,936,614
18AD 3,936,615
18BG 3,936,613
18GE 3,936,612
41A 3,936,616
84R 3,936,617
100.4ST 3,936,618
3,936,619

CLASS 180
33R 3,935,916
53R 3,935,917
79.2R 3,935,918
82C 3,935,919
89A 3,935,920
89R 3,935,921
98 3,935,922

CLASS 181
33K 3,935,923
169 3,935,924
192 3,935,925

CLASS 182
208 3,935,926

CLASS 188
73.3 3,935,927
73.4 3,935,928
331 3,935,929
344 3,935,930

CLASS 190
19 3,935,931

CLASS 192
13R 3,935,932
46 3,935,934

CLASS 194
4R 3,935,933
78 3,935,935

CLASS 195
4 3,936,351
36R 3,936,352
37 3,936,353
79 3,936,354
100 3,936,355
103.5R 3,936,356
3,936,357

CLASS 197
1R 3,935,936
53 3,935,937
114R 3,935,938
175 3,935,939

CLASS 198
25 3,935,940
139 3,935,941
157 3,935,942

CLASS 200
47 3,936,620
61.08 3,936,621
85R 3,936,622
158 3,936,623
283 3,936,624

CLASS 201
39 3,936,358

CLASS 203
6 3,936,359
75 3,936,360

CLASS 204
2 3,936,361
86 3,936,362
105R 3,936,363
159.2 3,936,365
159.23 3,936,366
181 3,936,367
3,936,368

CLASS 206
45.34 3,935,943
223 3,935,944
343 3,935,945
516 3,935,946

CLASS 208
139 3,936,369
210 3,936,370
251H 3,936,371

CLASS 209
3 3,936,372
17 3,936,373
111.8 3,935,947

CLASS 210
31C 3,936,374
42S 3,936,376
45 3,936,375
84 3,936,377
107 3,936,378
131 3,936,379
170 3,936,380
195R 3,936,381
198R 3,936,382

CLASS 211
23 3,935,948
168 3,935,949

CLASS 214
1BB 3,935,950
1P 3,935,951
17D 3,935,952
145A 3,935,953
352 3,935,954

CLASS 215
1C 3,935,955
100R 3,935,956

CLASS 219
10.51 3,936,625
10.55F 3,936,627
10.55M 3,936,626
56 3,936,628
68 3,936,653
73 3,936,654
3,936,655
76 3,936,656
136 3,936,657
216 3,936,658
413 3,936,659
459 3,936,660
528 3,936,661

CLASS 220
9LG 3,935,957
19 3,935,958
22 3,935,959
260 3,935,960
266 3,935,961
306 3,935,962
315 3,935,963
318 3,935,964

CLASS 221
48 3,935,965
75 3,935,966
222 3,935,967

CLASS 222
56 3,935,970
134 3,935,971
146HE 3,935,972
182 3,935,973
402.13 3,935,974
479 3,935,968
490 3,935,975
541 3,935,969

CLASS 223
88 3,935,976

CLASS 224
45S 3,935,977

CLASS 225
15 3,935,978

CLASS 226
19 3,935,979
43 3,935,980

CLASS 227
19 3,935,981
101 3,935,982
110 3,935,983

CLASS 228
45 3,935,985
115 3,935,986
213 3,935,987
252 3,935,988

CLASS 229
31R 3,935,989
34R 3,935,990
3,935,991
38 3,935,992
53 3,935,993

CLASS 232
36 3,935,994

CLASS 233
26 3,935,995

CLASS 235
61.12N 3,936,662
95 3,935,996
98C 3,935,997
150.51 3,936,663
151 3,936,664
151.3 3,936,665
3,936,666
185 3,936,667

CLASS 236
1C 3,935,998

CLASS 239
288.5 3,935,999
3,936,000
289 3,936,001
455 3,936,002
559 3,936,003

CLASS 240
4.2 3,936,668
3,936,669
41.3 3,936,670
46.59 3,936,671
47 3,936,672

CLASS 241
5 3,936,004
83 3,936,005

CLASS 242
18A 3,936,006
67.1R 3,936,007
75.44 3,936,008
118.11 3,936,009
194 3,936,010
198 3,936,011

CLASS 244
16 3,936,012
40A 3,936,013
83F 3,936,015
83R 3,936,014
103S 3,936,016
110B 3,936,017
136 3,936,018
137R 3,936,019
153R 3,936,020

CLASS 248
54CS 3,936,021
137 3,936,022
228 3,936,023
243 3,936,024
345.1 3,936,025
349 3,936,026
358AA 3,936,027

CLASS 250
209 3,936,629
211J 3,936,630
227 3,936,631
237R 3,936,632
273 3,936,633
281 3,936,634
325 3,936,635
336 3,936,636
352 3,936,637
358R 3,936,638
369 3,936,639
372 3,936,640
439 3,936,641
469 3,936,642
478 3,936,643
486 3,936,644
3,936,645
3,936,646
512 3,936,647
554 3,936,648
558 3,936,649
571 3,936,650

CLASS 251
5 3,936,028
61.1 3,936,029
129 3,936,030
284 3,936,031

CLASS 252
63 3,936,383
90 3,936,384
99 3,936,385
3,936,386
171 3,936,387
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CLASSIFICATION OF PLANTS

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P. — 88 3,828

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

73— 362AR T943,003
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156— 123 T943,005
260— 2.5N T943,007
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444— 1 T943,001
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3,936,708
2 : 3,935,658
4 : 3,935,641
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6	238,625		238,718		238,634		238,698	36	238,643		238,717
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	238,635	9	238,626		238,710		238,650		238,661		238,667
	238,639		238,669	18	238,636		238,658		238,680		238,671
	238,651		238,702		238,677	29	238,690		238,683	40	238,627
	238,662		238,703		238,679		238,722		238,688	41	238,697
	238,664	12	238,640	20	238,652	31	238,638		238,689	42	238,644
	238,666		238,653		238,672	34	238,623		238,693	45	238,655
	238,668		238,657		238,714		238,641		238,695	47	238,663
	238,670		238,685		238,715		238,649		238,696	48	238,628
	238,692		238,700	24	238,630		238,659		238,705		238,709
	238,694		238,721		238,645		238,673		238,708	55	238,674
	238,699	13	238,678	25	238,681		238,686		238,720		238,701
	238,711		238,684		238,712		238,716				

PLANT PATENTS

6	3,829	53	3,828								

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

1	T943,003	10	T943,010	36	T943,001		T943,007	47	T943,005	48	T943,002
8	T943,004	12	T943,009		T943,006						

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U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*